



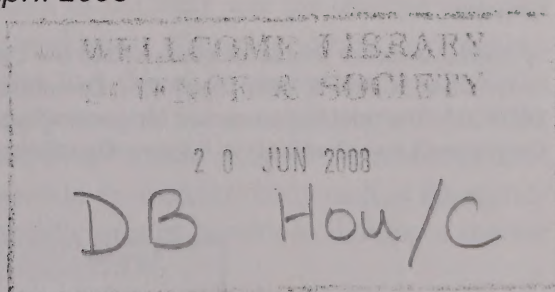
House of Commons

Innovation, Universities,
Science and Skills Committee

Investigating the Oceans: Government Response to the Science and Technology Committee's Tenth Report of Session 2006–07

Fourth Special Report of Session 2007–08

*Ordered by The House of Commons
to be printed 30 April 2008*



DB Hou/C

HC 506 [Incorporating HC 469-i]
Published on 15 May 2008
by authority of the House of Commons
London: The Stationery Office Limited
£13.00

The Innovation, Universities, Science & Skills Committee

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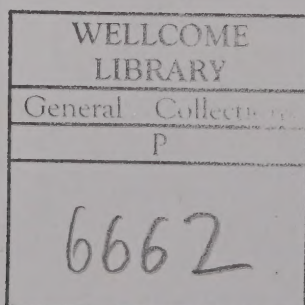
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Contacts

All correspondence should be addressed to the Clerk of the Innovation, Universities, Science & Skills Committee, Committee Office, 7 Millbank, London SW1P 3JA. The telephone number for general inquiries is: 020 7219 2793; the Committee's e-mail address is: iuscomm@parliament.uk.



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Fourth Special Report

On 18 October 2007 the Science and Technology Committee published its Tenth Report of Session 2006–07, *Investigating the Oceans*, [HC 470–I]. On 19 December 2007 the Committee received a memorandum from the Government which contained a response to the Report. The memorandum is published without comment as an appendix to this Report. The Committee took oral evidence from the Rt Hon Hilary Benn MP on Tuesday 22 April in connection with the Government response. The oral evidence together with a further memorandum from the Government, is also published without comment as an appendix to this Report.

Appendix 1: Government response

Introduction

The Government welcomes the Committee's report which is timely and identifies a number of key issues which affect marine science, including its management and coordination. The report also highlights some important weaknesses in the current system and proposes a number of solutions, the central one being the creation of a new marine agency.

The Government accepts many of the Committee's recommendations. It does not however accept that a new agency offers the best solution. This Response proposes adopting an alternative to the agency, and replies in detail to each of the 59 conclusions and recommendations. By its nature, the Committee's report has covered some policy areas that are devolved to the administrations in Wales, Northern Ireland and Scotland. The reply has been prepared with their co-operation.

Recommendation for a marine agency

The Committee suggests that many of its recommendations can best be tackled through the creation of a new marine agency. Because of the prominence given by the Committee to the agency as a proposed solution the Government wishes to address this issue first.

The Committee's report calls for the replacement of IACMST and the creation of a new agency in order to tackle many of the current weaknesses of marine science management and co-ordination. Whilst the Committee states that this is its **preference** it also leaves open the possibility of other mechanisms being proposed. For example recommendation 37 asks that the marine agency "or an **equivalent body**" should facilitate the release of data; and recommendation 58 includes earlier reference to an executive body such as the agency or a **successor** body to IACMST with substantially greater powers to develop a marine science strategy.

The Government has carefully considered the Committee's recommendation to establish a new marine agency, but has decided instead to adopt an alternative approach, that of creating a new committee which will replace IACMST and bring the principal funders together into an effective group.

The reasons why the Government rejects the Committee's recommendation to create a marine agency in order to address current weaknesses are as follows:

- i. The creation of a UK marine agency is not feasible given current developments related to devolution.
- ii. The new agency will require additional funding at a time when budgets are under pressure.
- iii. The Government wishes to respond rapidly to the Committee's recommendations and creating a new agency would, in the Government's opinion, delay this.
- iv. UK marine science ranges from blue sky, basic research of the type supported by Research Councils, to "applied" research funded by Departments for the purpose of providing "evidence" to policy. A "one size fits all" approach to marine science as suggested by the creation of an agency is not seen as appropriate.
- v. Marine policy is the responsibility of a number of different departments and funding agencies. Each of these has specific requirements for marine science, including providing "evidence" on which to base specific marine policies and decision making. These departments and agencies are themselves responsible for ensuring that there is effective communication with stakeholders, developing collaborative links, ensuring facilities and vessels are used effectively etc. It would not be appropriate to pass some of these responsibilities to a new executive agency.

In summary the Government's overall rationale for preferring an alternative to the agency is that the Departmental funders of marine science are best placed, and should be responsible for, the proper management of their science, including effective collaboration and coordination with others. The Government considers that creating an agency risks the science being too remote from those who need it. The "marine" label implies a uniformity of purpose among agencies which is not in practice the case. Government agencies address a wide range of different policy issues which, though they all take place in a marine context and may interact, are no more closely linked than all terrestrial activities and are better managed separately. The Government considers that it is for the funders to tackle weaknesses, either individually or together as appropriate, rather than creating a new executive body.

Taking the above into account the Government proposes instead to create a new committee, the Marine Science Co-ordination Committee (MSCC), which will bring together the principal public investors in marine science to tackle cross-Departmental issues identified in the report.

Proposals for the Marine Science Co-ordination Committee

The Government accepts that the current cross-Departmental mechanisms for marine science management and co-ordination, undertaken by the Inter-Agency Committee on Marine Science and Technology (IACMST), has its weaknesses. IACMST has also had some successes which should not be overlooked. The Government wishes to tackle the weaknesses and build on the successes. This section of the Government's response sets out

the current thinking on the function, membership, working arrangements, governance, reporting and timing of the new Committee.

The time constraints placed on providing the Government response means that it has not been possible to reach detailed agreement on all aspects of the new committee, including reporting lines. However Defra¹, DIUS, Scottish Government, DARDNI, MOD, EA and BERR, the principal funders of marine science, have reached broad agreement that a new committee is a more practical and realistic option to that of creating a new marine agency.

Function

The MSCC will provide new leadership in coordinating and ensuring a strategic approach to marine science in the UK, working closely with the wide range of bodies involved in this area to add value to existing programmes and activities. An early priority will be to lead development of a marine science strategy, and to address other recommendations from the Committee's report which cannot best be addressed either through current co-ordination mechanisms or by individual sponsors on their own.

Membership

MSCC will be composed of the main Government funders of marine science, including NERC. Meetings will be attended by senior Departmental/Agency officials, including their scientific advisers, who have specific responsibilities for the funding and management of marine science, and are able to make decisions after the normal consultation process within their departments.

Working arrangements

A memorandum of understanding, collaborative agreement, or other such mechanism, will be developed and signed by all members. This will set out the agreed way of working for the committee including what is expected of each member, the level of annual funding to be provided for the committee's business and the adoption of a work plan. The committee will be supported by an appropriately resourced secretariat. The committee will also be supported by a number of working groups which will be commissioned to undertake specific pieces of work, resourced by the committee. Involvement of the wider stakeholders including industry will be through these groups. Specialists from academia and stakeholders including from industry will be invited to attend committee meetings as appropriate.

Governance and reporting

The MSCC will be chaired by a member of the committee, probably on a rotating basis. The committee will produce an annual report which sets out progress made during the year including any constraints encountered, how these are to be tackled, and setting out plans for the committee's work over the coming 12 months. MSCC's reporting arrangements have still to be agreed between the proposed members, and will be developed as part of detailed planning work for its establishment over the next 4–6 months, to ensure

1 Defra's science programme takes into account research needs in Wales.

it has the right levers and authority to be able to deliver. Options include one or more of the following:

- Reporting through a Minister in a lead Department and in the Devolved Administrations.
- Reporting to the relevant ministers in member departments and the Devolved Administrations
- Reporting to the Chief Scientific Advisers in each member department and the Devolved Administrations, or their equivalent.
- On any interdepartmental issues that need resolving, reporting to the Sub-Committee on Environment and Energy of the Ministerial Committee on Economic Development subject to normal concordat arrangements in the formulation of the UK position.

In addition, the Committee might present a report annually to the Chief Scientific Advisers' Committee (CSAC), chaired by the Government Chief Scientific Adviser.

Timing

The committee will form and have its first meeting within four to six months of the date of this response. The committee's first priority will be to agree on the shape and content of a UK Marine Science Strategy, and to commission its drafting.

The above sets out the broad plans for the new committee. Further details are provided in the response to specific recommendations. Specific responses provided by the Research Councils are indicated in italics.

Government Response to Committee's Conclusions and recommendations

Exploitation of the oceans

1. We recommend that greater research effort be directed by UK public sector funders towards the understanding and mitigation of the impact of fishing on marine environments, and the coming Marine Bill must address this issue. (Paragraph 32)

The Marine Bill will introduce new mechanisms for managing marine activities and protecting marine resources. In particular a new system of marine planning will enable us to take a strategic view of the way in which different marine activities, including fisheries, are interacting in particular areas of the sea, and the cumulative impact they are having on the environment and natural resources.

Research provides a valuable source of information to help ensure that any new planning and management processes introduced by the Marine Bill work effectively. There are already extensive research efforts into the impacts of fishing and mitigation methods and results have significantly advanced our knowledge in this area. For example research funded by Defra at Cefas has led to methods for predicting the effects of fishing on the structure of fish communities and the abundance of rare fish species. This has supported

the development of indicators of the effects of fishing on marine food webs and rare and vulnerable species, all of which help to provide information on trends in marine biodiversity.

Research on other aspects of impacts of fishing includes work on fishery/seabird interactions funded by the Scottish Government, and research quantifying the effects of different gear types on the marine ecosystem and the length of time needed for ecosystem recovery at Plymouth Marine Laboratory.

Research has also helped identify practical measures that can be taken to reduce fishing impact. Collaborative research with the fishing industry has led to the re-design of fishing nets to reduce undesirable bycatches in fisheries where they are known to occur. An example is the development of a 'benthos release panel' to reduce the impact of beam trawling on bottom-dwelling communities and small non-commercial fish.

Defra has also funded significant work with the Sea Mammal Research Unit of St. Andrews University which has provided a greatly improved understanding of the nature and scope of the problem of bycatch of small cetaceans in different fishing gears and of possible mitigation measures.

Taken together, this work provides a good knowledge base of fishing impact and advice for developing appropriate management measures. Much of the research referred to above (particularly work at Cefas and Fisheries Research Services, Aberdeen), has been at the forefront of science in this area at the European level and has leveraged additional funding from the European Commission.

While there is further work to be done, in particular in relation to fisheries indicators of ecosystem health and in relation to specific impacts on particular habitats, in many cases it is in the understanding of the range and diversity of marine habitats and species that there are greater gaps in knowledge than in understanding the impacts of fishing.

Priorities for marine research

2. The world's oceans are fundamental to the continuing ability of human beings to survive comfortably on this planet, and it is vital that efforts to understand them are pursued with clarity, co-ordination and purpose, but also with an open mind as to future areas of importance. (Paragraph 43)

The Government shares the Committee's view of the importance of marine science, including the need to maintain a proper balance across the wide range of science themes and the need to support both policy related science and research into understanding the basics of the marine environment and its processes.

There is growing, but not yet complete, recognition of the vital role of the oceans in the functioning of the earth's life-sustaining processes. The oceans and seas offer the key to finding solutions to pressing human needs, many of which need further research and evaluation. These include energy, food, water, health, waste management, transport and quality of life. Understanding and predicting climate—and even medium-range weather—depends critically on knowing that the oceans and atmosphere behave as a completely coupled system.

Improving marine science coordination, strengthening links between science and policy, and developing more strategic approaches will be among the tasks to be tackled by MSCC.

Funding and organisation of marine science in the UK

3. We recommend that funding be identified by the sponsoring Government department for a regular survey of marine-related research and development in the UK by the IACMST or any successor body with responsibility for co-ordination in this area. (Paragraph 46)

A high-level summary of the overall expenditure by Departments can provide a useful indication of budget size and distribution. However compiling data for detailed analysis between years and between funders is complicated by the different funding models adopted. For example research costs do not always include full cost of depreciation, capital costs, land and building costs etc.

The Pugh and Skinner publication referred to provided a useful snapshot but went wider than marine science, covering oil and gas production, tourism revenue and shipping. The MSCC will need to consider whether an annual summary of marine science spend is appropriate or whether current more targeted compilations such as that prepared by the Defra, Scottish Government, and DARDNI composed Fisheries and Marine Science Customer Group, and the ERFF Research Database is sufficient for specific sectors.

Research Councils: NERC

4. The declining trend in NERC funding for marine science is a worrying one and we seek an explanation from NERC as to why marine science has apparently been less of a priority than other areas within the NERC remit. (Paragraph 62)

Given the Committee's conclusion, NERC has reviewed its funding contribution further. Full and corrected data regarding NERC funding for marine science show that there has been an upward trend in NERC expenditure on marine science over the past eight years. Marine science will remain a high priority for NERC as it delivers its new 5-year science strategy, Next Generation Science for Planet Earth.

NERC has produced a corrected version of the report's Table 6 (see Table 1 below), which provides information on all NERC marine science expenditure – with the exception of expenditure at the British Antarctic Survey, British Geological Survey and Centre for Ecology and Hydrology. This corrected table includes the responsive-mode funding and the marine funding elements of interdisciplinary programmes such as SOLAS, MFMB and of the Earth Observation Centres of Excellence. It also separates out the NERC expenditure on large exceptional items such as the new POL building, the RRS James Cook and the replacement of the RRS Discovery's scientific winch system.

Table 1 shows an upward trend in NERC expenditure both in cash terms and, using the Government's GDP deflator, also in NERC expenditure in real terms between 1999/00 and 2006/07 – with expenditure (excluding blue-skies and exceptional items) increasing in real terms by around £11M over this period. The corrected table show that "overall expenditure,

excluding response mode grants” in 2006/07 was around £0.5M more in real terms than in 2003/04.

Total NERC expenditure (inclusive of blue-skies and exceptional items) was around £15M more in real terms in 2006/07 than 2001/02.

Table 1: NERC Marine Science Expenditure

	£m	£m	£m	£m	£m	£m	£m	£m	£m
Expenditure heading	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	Total
1. Ship operations expenditure in support of the NERC Cruise Programme	7.0	4.6	7.6	8.7	10.7	9.8	11.5	13.0	72.8
2. Marine centres expenditure	16.8	17.8	18.2	20.5	20.2	19.4	22.3	24.2	159.4
3. Directed programmes	6.6	7.4	8.5	9.9	12.9	11.4	11.1	10.5	78.3
Sub-Total (1+2+3)	30.4	29.8	34.3	39.1	43.7	40.5	44.9	47.8	310.5
4. Blues skies (responsive mode funding)*	**	**	5.2	5.8	5.4	6.0	7.0	7.9	37.3
5. Exceptional Items (e.g. large facilities capital, building costs, etc)				2.8	6.6	4.1	7.2	4.4	25.0
Total (1+2+3+4+5)	30.4	29.8	39.5	47.7	55.7	50.7	59.0	60.1	372.8

* Revised expenditure data include cruise costs

** Blue-skies expenditure data unavailable

5. We accept that NERC acts in good faith to support the best science in awarding funding under the responsive mode and that the number of applications is small, but we believe that the apparent bias against funding for marine science applications requires investigation and explanation from NERC. (Paragraph 66)

NERC recently carried out a responsive mode funding review which reported in February 2007 to NERC Council. As a part of this review the distribution of grants awarded against science area was investigated. There was no evidence of subject bias, although as indicated in paragraph 66 of the Committee’s report, where numbers of applications are small it can be difficult to draw firm conclusions.

Despite not finding evidence of bias, NERC is planning a review of its Peer Review College which will, amongst other things, examine whether there is consistent and unbiased peer review across all areas.

6. We recommend that NERC commit funding to the full five years of the Oceans 2025 programme in order to enable proper planning and effective organisation. In doing so, it needs to ensure that the longer term programmes and facilities are not packaged together with the short term projects in the same project cycle, so that each can be assessed against their natural lifespan. (Paragraph 70)

The Government's Comprehensive Spending Review covers only a three-year period, and Councils have to take this into account when committing funding to new research programmes. Councils are experienced in supporting long-term science investments which spread across one or more spending review period. Following the allocations to individual Councils announced in October, NERC Council will shortly decide the funding of the final three years of the Oceans 2025 programme.

Through NERC's new funding allocation and budgeting mechanism, programmes such as Oceans 2025 will have a national capability component and a research programme component, and the funding of these components will be considered over the longer and shorter term, respectively.

7. We recommend that NERC review the use of the Strategic Ocean Funding Initiative, with a view to increasing the amount allocated to it within the Oceans 2025 programme and encouraging participation from universities in Oceans 2025. (Paragraph 71)

The Strategic Ocean Funding Initiative is currently being implemented, but will be superseded from 2008 by NERC's new funding arrangements. These new arrangements will enable more collaborative programmes between universities and Centres in NERC-funded research programmes, complementing what is already planned through Oceans 2025.

8. We recommend that NERC review the need for a director of science for marine and atmospheric science. (Paragraph 74)

NERC had a Director for Marine and Atmospheric Sciences from 1986 until 1994, when the decision was made to replace Directors of Science by Directors of Centres. The main emphasis in NERC's science strategy is now on themes (supported by national capability) which cut across the science areas. NERC has recently recruited Theme Leaders to provide greater direction and leadership in science delivery. NERC considers that a return to a sector-based directorate structure would inhibit development of interdisciplinary research programmes within the context of a broadly-based thematic strategy.

However, NERC will organise in a sector-based way the management of its long-term national capability functions (e.g. large facilities such as ships, sustained observing, data) which support thematic research programmes and responsive research. NERC considers that the Director of the National Oceanography Centre, Southampton (NOCS) would play a particular role in facilitating strategic oversight of NERC marine national capability within NERC's wider national capability portfolio.

Other Research Councils

9. We recommend that RCUK monitor applications and inquiries to ascertain whether there has been improvement in funding interdisciplinary work in marine science areas as a result of recent changes. (Paragraph 82)

The Government agrees that it is important to ensure that there are no inherent barriers to multidisciplinary research. The Government and RCUK view this as an important issue across all fields of research, not as one specific to marine science. Research Councils already report on multidisciplinary input metrics to DIUS as part of their Performance Management System.

Multidisciplinary research is, by its nature, very difficult to label; it is therefore difficult to classify individual multidisciplinary research projects for monitoring and comparison on a disciplinary basis. The RCUK Performance Evaluation Group is, however, currently investigating ways of extending the monitoring of Research Council support for multidisciplinary research.

10. We recommend that scientists working in marine research in the UK be eligible to apply for funding to any of the Research Councils, regardless of their place of employment. (Paragraph 83)

The Government recognises the Committee's concern that researchers should have access to appropriate funding. All UK Higher Education Institutions and Research Institutes (with which Research Councils have established a long-term involvement as major funders), as well as a number of Research-Council-recognised Independent Research Organisations (IROs) are eligible to apply for various types of Research Council funding.

The set of criteria for eligibility of IROs was agreed by Research Councils and DIUS, and is implemented collectively to ensure consistency; organisations which meet the published eligibility criteria and wish to become Research-Council recognised may contact any Council to begin a review of their status. Other individuals and organisations can act as subcontractors on Research-Council-funded programmes through collaborative association with an eligible institution and organisations.

NERC's eligibility criteria allow most UK marine scientists to apply for funding from NERC, providing that their main source of research funding is not a government department or other public sector body (unless that body is co-funding the research programme) or a business². Some independent research organisations³ are eligible only for managed-mode funding.

Government departments

11. We recommend a review be commissioned by Defra and NERC jointly on mechanisms for improving the relationship between the marine centres and the fisheries laboratories and for encouraging collaboration and co-ordination of research effort. (Paragraph 90)

There are already a number of good examples of collaboration between marine centres and fisheries laboratories. For example this year NERC, Defra, FRS and AFBI jointly funded a successful £2.4 million "Sustainable Marine Bioresources" programme which was designed to meet joint strategic aims. In addition, several of NERC's Research and Collaborative Centres have been or are involved in other projects with the fisheries laboratories, and these interactions are fairly numerous – though generally more ad hoc and less strategic in nature.

More however can be done on collaboration and co-ordination and Defra and NERC will commission a review. Other fisheries departments will be invited to participate in this exercise.

2 <http://www.rcuk.ac.uk/cmsweb/downloads/rcuk/documents/eligibilitystatement.pdf>

3 <http://www.rcuk.ac.uk/research/eligibility.htm>

12. We recommend that the role of the UKHO as a marine research establishment be explicitly considered as part of the MoD review of the future of the Office. (Paragraph 96)

The MOD structural and ownership options review has considered the role of UKHO in the formation of marine policy and the support that UKHO bathymetric data and cartographic products provide to the UK's wider interests including marine research. This consideration was relevant to the report conclusions and recommendation that UKHO continue to operate as an executive agency, financed through a Trading Fund. This status should ensure the wider benefits to the UK from the expertise of the Hydrographic Office are sustained.

We accept the Committee's view that UKHO "analyses data from its own and external sources and also creates products from those data, both of which are research-driven activities". However, the UKHO does not carry out research; rather its activities take the outcomes of research conducted elsewhere and apply these to the development of products and services for its customers.

We agree that the UKHO's "core task of managing such large quantities of data gives the UKHO a central role in working on data standards so that the data can be easily accessed and interpreted by scientists and policy-makers in the marine sector." For example, the UKHO participates in the Open Geospatial Consortium, developing geospatial standards; and in the International Hydrographic Organization's development of its S100 standard for electronic charting. However, we do not consider that this activity constitutes research.

The UKHO Marine Environment Information Centre works only in support of UK Defence. In doing so, from time to time, it does identify gaps in research knowledge which can inform the Defence research programmes commissioned and carried out elsewhere. However the MEIC does not engage in or commission research.

Government will look to correct the listing of UKHO as a Public Sector Research Establishment (PSRE).

Overall funding

13. A full review of future needs for increases in funding marine science, along the lines of the work undertaken already on marine monitoring requirements, is urgently needed. Nevertheless, it is clear, even without such a detailed review, that a substantial increase in funding is necessary if marine science is to meet the challenges before it. (Paragraph 102)

The future requirements for marine science funding have to be set against other priorities for science and to meet other pressures. The prioritisation and funding process is formalised through Departments' business plans that are submitted to Treasury. Improving co-ordination and collaboration within the UK, with other Member States and internationally is a practical way of reducing pressures on budgets, and promoting better co-ordination will be a core activity for MSCC. The development of a Marine Science Strategy will help identify science priorities and the need for improved co-ordination and collaboration.

Inter-Agency Committee for Marine Science and Technology (IACMST)

14. It is unacceptable for a Government-funded body chaired by a Chief Scientific Adviser to be ignorant of its formal reporting responsibilities. We recommend that reporting lines for the IACMST be clarified without delay. Defra and DIUS, including the Government Office for Science, need to discuss lines of responsibility and what reporting procedures are required and communicate the results clearly to the IACMST. (Paragraph 109)

As set out at the start of this response, It is proposed that MSCC will replace IACMST, and MSCC will adopt new and more effective reporting lines. These will be developed as part of detailed planning work for its establishment over the next 4–6 months, to ensure it has the right levers and authority to be able to deliver. Options include one or more of the following:

- Reporting through a minister in a lead Department and in the Devolved administrations.
- Reporting to the relevant ministers in member departments and the Devolved Administrations.
- Reporting to the Chief Scientific Advisers in each member department and the Devolved Administrations, or their equivalent.
- On any interdepartmental issues that need resolving, reporting to the Sub-Committee on Environment and Energy of the Ministerial Committee on Economic Development subject to normal concordat arrangements in the formulation of the UK position.

In addition, the committee might present a report annually to the Chief Scientific Advisers' Committee (CSAC), chaired by the Government Chief Scientific Adviser.

15. We recommend that DIUS play a more active part in the successor body to the IACMST which we recommend later in this Report. (Paragraph 110)

The membership of the proposed Marine Science Coordination Committee will need to be determined as detailed plans for its establishment are developed over the next few months. It will be important for the membership to match the specific role and functions set for the committee.

16. We do not believe that the IACMST as currently constituted is capable of fulfilling the role required of it by the challenges facing marine science. It is fundamentally flawed in its constitution, and minor amendments to its budget or resources will not transform the organisation of marine science in the UK. (Paragraph 114)

The Government accepts that for several reasons IACMST needs to be replaced by a strengthened body. As set out at the start of this response, it is proposed that MSCC will take over, build on and expand the responsibilities and function of IACMST.

Improving co-ordination of marine science and technology in the UK

17. We recommend that a new co-ordinating body for marine science, reporting to Defra, be established. This body should bring together all public-sector funders of marine research, together with stakeholders such as the universities and end-users of marine science, and should be properly resourced to fulfil its functions. Because of the range of activities for which greater co-ordination is required at an executive level, our preference would be for this co-ordinating function to be placed with a new marine agency, which should be given executive powers and a budget to oversee operational observations. (Paragraph 132)

The Government agrees that for the reasons highlighted in the Committee's report an alternative to IACMST is required. The preferred option, as set out in this response, is for a new committee to be formed which will address the current weaknesses. To answer the specific points made in this recommendation:

- The reporting arrangements for the new committee will be developed as part of detailed planning work for its establishment over the next 4–6 months, to ensure it has the right levers and authority to be able to deliver.
- MSCC will bring together all the major public sector funders of marine science. Other stakeholders, such as universities and end users, of marine science will not sit on the committee. However the working groups that are commissioned to undertake specific tasks will provide good opportunities for stakeholder involvement.
- The MSCC will be reasonably resourced, taking into account current budgetary constraints.

18. We believe that the transfer of functions to the new marine agency should provide an opportunity to reduce the number of co-ordinating bodies operating in this area and we recommend that the Government review the organisations, committees and other bodies co-ordinating marine-related activities with this aim in mind. (Paragraph 133)

The marine science sector is very complex, as illustrated in the report's own Figure 1. The "marine" label implies a uniformity of purpose amongst agencies and associated science which is not in practice the case. As in the terrestrial sector there is a need for effective co-ordination at a number of levels and on a wide range of topic areas.

Taking this into account, one of the tasks for the MSCC could be to examine whether there are opportunities to reduce the number of co-ordinating bodies. This task will need to be linked to the ERFF's plans to commission a review of co-ordinating bodies. ERFF aims to examine their roles, responsibilities and reporting lines, and to identify a rational arrangement that would reduce duplication of effort, for example in cross-cutting areas such as monitoring, science to policy activity and the skills base. MSCC will need to wait for the output from ERFF work before deciding whether this is a priority area.

Research vessels

19. We believe that there is scope for better integrated management of the coastal fleet although this may well be limited in view of the demands upon it. A new marine body could act as a clearing house to co-ordinate research cruises and spare capacity on marine science vessels. (Paragraph 143)

Research vessels are an integral part of marine science. They are also a major cost item of marine science programme budgets. Research vessel cruises are tasked to undertake a wide range of activities, for example assessing fish stocks, monitoring the state of the marine environment and undertaking discrete research projects. In practice it is frequently not possible to multi-programme individual cruises since each programme of research requires different gear, different scientific teams and covers different regional areas.

As part of routine good management practice the operators of research vessels already co-ordinate their activities on a number of fronts. For example CEFAS, FRS and AFBI cruise programmes are exchanged at the planning stage and collaboration does take place. There is also a very extensive co-ordination of fish stock surveys at the European level, overseen by ICES. For NERC the ocean-going nature of much of its ship-based research means that international ship barter arrangements are the most appropriate way of managing its fleet. A similar regional barter arrangement could probably be established by the owners of UK coastal vessels, although relying on the readiness of ship owners to participate, and the overall availability of vessels.

It is concluded that the co-ordination of research vessel activity is being reasonably well managed and co-ordinated at present, and it is best left to the vessel operators and science managers to identify where improvements might be made. The Committee's concerns are however noted and this aspect of co-ordination may need to be addressed by MSCC at some stage in the future.

20. We welcome the world-wide extension of the Continuous Plankton Recorder concept as an excellent initiative and we urge the UK Government to take the lead in promoting it to fellow Governments at the next GEO Ministerial. (Paragraph 146)

NERC and Defra, as major funders of the Continuous Plankton Recorder Survey, welcome the world-wide extension of the CPR concept. SAHFOS, which runs the CPR Survey, participated in the GEOIV Ministerial Exhibition in Cape Town as an opportunity to demonstrate UK leadership for cost-effective monitoring of the biological health of the ocean. Based on the outcome of the Ministerial, the UK will discuss options for global CPR extension with the GEO Secretariat as part of the future GEO Work Plan.

21. We recommend that NERC investigate the costs and benefits of a scheme for the widespread use of commercial vessels to take ocean measurements, with a view to providing UK leadership on this project. (Paragraph 148)

NERC's Research and Collaborative Centres already make considerable use of commercial vessels. For example the Proudman Oceanographic Laboratory uses the Norfolk Line (part of Maersk), the National Oceanography Centre, Southampton uses the Pride of Bilbao and the

Indo Trans Celebes for FerryBox work⁴ and the Plymouth Marine Laboratory has mounted data-gathering equipment on vessels crossing the Channel and the Atlantic.

NERC would be prepared to consider, with its marine research community, how more use could be made of commercial vessels, but it is clear that commercial vessels do not generally offer the bespoke facilities, specialist crew or flexibility afforded by dedicated research vessels, and expectations should be realistic. Commercial vessels are not suitable for some Research Centres' operations because of their specialist requirements, or because they are too expensive to charter or obtain time or facilities on. It must also be noted that no matter how cost-effective a proposed science programme on a commercial ship is, the proposed programme will need to be tested against the standards of excellence required for success in the competition for NERC funds.

22. We conclude that there is greater demand for ship-time than the current arrangements are capable of delivering and that vessel capacity is a limiting factor in marine research. (Paragraph 151)

The evidence gathered for this response indicates that it is budgets rather than ship-time that is the limiting factor. If future science budgets are to grow without additional vessel capacity then ship-time will indeed become a limiting factor, but that is not currently the case. NERC's own ships are well utilised for ocean going science, its international barter arrangements are very effective, and time can be booked on the RV Prince Madog for coastal science when necessary. NERC recognises, however, the interplay between science demand and platform availability and will review whether there is a case for a shelf sea research vessel capacity beyond what is already available including through charter or barter.

23. We recommend that an independent review be conducted of the cost-effectiveness of NERC's operation of its research vessels and management of alternative arrangements for access to vessels. (Paragraph 154)

The cost-effectiveness of NERC's ship operations was recently reviewed as part of the Office of Government Commerce's Gateway Review Process and the decision was made that NERC should continue to own and operate its new ship, the RRS James Cook. Another review will be conducted shortly as part of the procurement process for the new ship to replace RRS Discovery. The NERC Marine Facilities Review Group meets twice a year and provides independent advice on all aspects of the ship management and cruise planning (incl. bartering and cooperation) that enable the cost-effective delivery of NERC's sea-going science programmes. These existing reviews address the issues referred to in this recommendation.

24. We fully support the development of the new vessel planned for 2011 and recommend that the Government and NERC commit to ensuring that this vessel is delivered on time and to specification. (Paragraph 155)

NERC welcomes the Committee's support for the development of the new vessel and we confirm that every effort will be made to ensure that a proper business case for the project is developed and submitted to the prioritisation process for the commitment of earmarked

4 <http://www.ferrybox.org/>

Large Facility Capital Funds and if successful, that the vessel is delivered on time and to specification.

25. We recommend that NERC develop a case for a new coastal vessel for submission to the large facilities roadmap and that DIUS look sympathetically upon such a bid. (Paragraph 155)

The NERC facility, the RV Prince Madog, supports NERC science programmes in UK coastal waters and it has capacity to take on more work year-on-year if more coastal science programmes are funded in the future. In addition, the Plymouth Marine Laboratory and the Scottish Association for Marine Science operate three inshore vessels in support of their science and these can also support NERC-funded science programmes.

NERC keeps under review its provision of major facilities in the light of evolving science demand and is prepared to review the evidence as to whether there is a case for a shelf sea research vessel capacity beyond what is already available including through existing vessels, charter or barter.

Other facilities

26. We recommend that the provision of facilities be regularly reviewed as part of the mandate of the proposed new co-ordinating body which would be the best available independent body to obtain objective information from potential users and providers, especially from those outside the NERC community. (Paragraph 156)

The report notes that the current arrangements are working effectively. It can be added, for example, that NERC's marine facilities are already subject to regular review using community wide user groups to provide year on year review, and Defra is undertaking a capacity review.

It is therefore concluded that the individual funders and their science institutes are fulfilling their responsibilities for ensuring that facilities are adequate, and this is not therefore a role for MSCC.

27. We encourage the development of partnership arrangements within Europe for the provision of highly advanced underwater technologies and infrastructure. (Paragraph 157)

The Government welcomes this conclusion and NERC will continue to actively develop its partnerships and wider arrangements within Europe through its involvement with the Ocean Facilities Exchange Group. These activities currently include the development of a bi-lateral arrangement with CSIC (Higher Council for Scientific Research) in Spain to utilise geo-physics equipment that will be deployed by a trans-national team.

28. We recommend that NERC keep the use of Isis under review and ensure that its potential is not undermined by factors such as the availability of crews or platforms. We further recommend that NERC investigate whether there would be more demand for use of Isis, if more time were offered. (Paragraph 158)

NERC's utilisation of its marine facilities is regularly reviewed through the NERC Marine Facilities Review Group. It should be recognised that ISIS delivers only a part of the scientific

needs of the Marine Facilities Programme and its use is balanced against the support of other requirements. NERC investment in sea-going programmes is science driven and should there be a requirement for increased support to ISIS the current support arrangements will be reconsidered.

Information technologies for marine science

29. We recommend that NERC keep under review the computing resources needed in the environmental sciences, particularly with regard to NERC's new theme of environmental change. (Paragraph 160)

NERC has recently increased capacity of both local clusters and national high performance computing (HPC) for its marine community. NERC is contracted for 10% of HPCx, the RCUK national service due to end in December 2008, and 22% of the new service, HECToR, which started operation in October 2007 and is scheduled to operate for 6 years. In addition to this increased capacity on the national HPC service, Oceans 2025 includes funding for local computer clusters at three marine centres, NOC, PML and POL. Computing provision will be continually reviewed by NERC's National Capability Advisory Group.

Government support

30. We regret the lack of attention paid by Government, in particular the OSI/DIUS, to marine science since the disbandment of the Marine Foresight Panel. We also regret that there has been no systematic attempt to track implementation of the recommendations made by the Marine Foresight Panel. We believe that greater effort is needed in horizon-scanning within the marine science and technology sector, and we recommend that this be included in the remit of the new marine body. (Paragraph 164)

In 2002 the Foresight Programme moved away from its earlier structure of standing panels to a more flexible project based approach, focusing resources more clearly where these would add greatest value. The approach was designed to allow new issues to be targeted and picked up quickly, via a fluid, rolling programme of projects. A key feature of the new approach is that leading participants are required to agree an Action Plan to take forward the findings of the project once Foresight involvement ceases, specifically to address the tendency for reports to sit on the shelf and for recommendations not to be taken on board.

Once Foresight moved in this new direction OSI (as was) did not have the resources to maintain a parallel strand of activity to follow up the large number of earlier reports and areas of activity, including in relation to the Marine Panel. Moreover, it is unlikely that such an activity would have been productive, with diminishing returns over time as the context for the earlier work evolved.

The Government Office for Science, within which the Foresight team is based, would be happy to consider a further project relating to the oceans and the marine environment provided it fulfilled the relevant criteria, which includes the necessary cross-government support. It is also relevant to highlight the Flooding and Coastal Defence Foresight project, completed in April 2004, including aspects of marine science.

The Government agrees that the proposed MSCC should include horizon scanning within its remit.

Gaps in data

31. We recommend that social system indicators be part of future research and monitoring priorities for UK marine science. (Paragraph 172)

The Government and RCUK recognise the importance of social and economic factors in marine issues, and their relevance to marine policy and management. For example, NERC and the Economic and Social Research Council are currently co-funding an interdisciplinary seminar series on marine ecosystem management, and the new Living With Environmental Change programme is expected to provide opportunities for interdisciplinary research in this area.

The need for the further development and use of social system indicators has also been recognised within the UK Marine Monitoring and Assessment Strategy (UKMMAS). The Productive Seas Evidence Collection Group (PSEG) has been tasked with the further development of socio-economic indicators to support the monitoring and assessment of the marine environment. This task is on-going with a strong lead currently being demonstrated by The Crown Estate.

Funding and co-ordination

32A. We recommend that the new marine agency, proposed in this Report, be made responsible for marine monitoring. It should also be responsible for setting priorities for monitoring and should have a central budget for operational monitoring and long-term international projects such as Argo. (Paragraph 180)

The Government believes that the responsibilities for marine monitoring should remain under the UK's Marine Monitoring and Assessment Strategy (UKMMAS) umbrella, with budgets for marine monitoring remaining with the relevant departments who are required to undertake monitoring as part of UK and EU-related statutory duties. The UKMMAS Marine Assessment Policy Committee (MAPC), which is chaired by Defra and the Scottish Government, includes all the Government Departments and the Devolved Administrations with responsibilities and policy requirements for obtaining evidence of the state of the marine environment. MAPC has a remit to identify new funding or, where necessary, to re-align existing funding in order to meet current and emerging monitoring requirements.

Although the UKMMAS does not have a central budget, funding is made available by those Departments and/or Agencies which have a direct interest in obtaining the evidence. The UKMMAS are working hard to ensure there is a trusted forum within which priorities and monitoring commitments can be discussed and shared amongst those able to provide funding.

However, the Government agrees that the policy relevance of operational monitoring programmes, and long-term monitoring programmes like Argo, need to be recognised,

and that they have a clearly defined sponsor and/or policy customer. We believe that the UKMMAS provides the best framework to achieve this.

In addition, the Environmental Observation Framework led by ERFF will be looking at financing mechanisms that will enable the UK to support sustained observations and monitoring in all natural environment disciplines. Observations in our oceans and seas will be regarded with equal weight to those on land or in the atmosphere. The priorities and the case for funding will need to be driven by the MAPC.

32B. We also recommend that the £22m funding gap identified by UKMMAS be met from central Government funds. (Paragraph 180)

The £22m funding gap identified for monitoring and assessment of the marine environment was calculated through initial coarse estimates supplied by members of the UKMMAS. The estimates have never been subjected to challenge or agreed with funding organisations, and this figure has always been considered as a first estimate. Further work is planned shortly to strengthen the evidence and process by which this initial figure was derived. Once this figure has been refined, further consideration will be given to the need to address any gaps by Government Departments and Devolved Administrations in light of all other commitments and requirements.

33. We support the use of cost-benefit assessment to establish the value of maintaining or stopping long-term monitoring programmes and recommend that it be adopted by the new marine body to ensure the efficiency of the UK monitoring programme and secure individual projects against threat of closure merely because they drop out of fashion. (Paragraph 181)

The UKMMAS is designed to ensure monitoring is 'owned' and, as such, provides a mechanism by which the importance and relevance of specific programmes of monitoring can be judged. Discussions and recommendations pertaining to the value of maintaining or stopping long-term monitoring programmes are held at all levels of the UKMMAS, with strong emphasis on the consideration of costs and benefits in light of current and emerging priorities.

The UKMMAS process has already achieved a number of efficiency savings within marine monitoring programmes and will continue to do so as the process evolves. New partnerships between Agencies are being forged all the time and this will only serve to strengthen support for current programmes of monitoring and the ability use existing resources in a more efficient manner.

International ocean monitoring systems

34. We recommend that the UK Government renew its commitment to GOOS and ensure that the network of observatories is completed according to the timetable. (Paragraph 184)

Good progress is being made to clarify the needs of GOOS in order to ensure they are adequately embedded and reflected within the UKMMAS process. The GOOS requirements, including the planned timetable for observatories, are being looked at in order to ascertain how they fit into current priorities.

35. We recommend that funding be guaranteed for the Argo programme from centralised funds. (Paragraph 185)

The UKMMAS process is establishing a mechanism for identifying and progressing the need for new and continued programmes of monitoring. All requirements for the continuation of existing monitoring programmes, including the Argo programme, and for new monitoring will be progressed through the Marine Assessment Reporting Group (MARG). Where new funding or a re-alignment of existing funding is required the Marine Assessment Policy Committee (MAPC) will make an informed decision based on the best available evidence, including current and future priorities and recommendations from MARG, and within the constraints of available resources.

Satellites

36. We recommend that the new marine agency, proposed in this Report, become a partner of the British National Space Centre in order that the needs of the marine science community be fully represented when discussing and determining space issues. (Paragraph 189)

The government welcomes strong end-user engagement within the BNSC partnership. There already exist formal and informal mechanisms by which the marine science community is or could be better represented. The Earth Observation Programme Board, a key BNSC advisory group, has had regular representation from senior marine scientists. Regular discussions occur on an informal basis. For instance, senior BNSC officials recently held bilateral discussions with representatives of the marine community on the issue of the European Global Monitoring for Environment and Security (GMES) programme. Defra membership of BNSC provides for a more policy-focused perspective on marine issues of relevance to the space community and has recently completed a study of marine observation requirements that will support this role. Future links with the marine science community can always be strengthened via one of these routes or by any new routes that emerge as a result of the current review of UK space policy.

Sharing data

37. We recommend that the principle of “collect once, use many times” be applied to marine data across Government, including the Royal Navy. We further recommend that the new marine agency which we have recommended, or an equivalent body, be charged with finding mechanisms to facilitate the release of data and interaction between producers, suppliers and users of data to maximise its value to the community at large. (Paragraph 198)

‘Collect once, use many times’ is widely acknowledged across Government as a fundamental principle in the management of marine data and is a cornerstone of the UKMMAS. Government is acutely aware of the need to maximise the value of data in order to meet a number of its key priorities such as the EU INSPIRE Directive, the Marine Bill, and Marine Planning. Government Departments and the Devolved Administrations have committed to the principle of ‘Collect once, use many times’ through the continued support of several key initiatives including the Marine Data and Information Partnership (MDIP), the Marine Environmental Data Action Group (MEDAG), and the UK Directory

of Marine Observing Systems (UKDMOS). It is through these initiatives and the on-going work within the UKMMAS that issues pertaining to the release of data will be addressed and interactions between producers, suppliers and users of data strengthened. MDIP and MEDAG currently report to their respective sponsor boards and through to IACMST. In future both will report to a new sponsor board. MSCC will continue to maintain an overview of marine monitoring and will establish links with the new board.

There are however some barriers to using data many times including issues relating to ownership and confidentiality. These are complex issues which will be tackled across government at the highest level as part of the Earth Observation Forum, and are being considered also by MAPC.

38. We recommend that the Government reconsider its opposition to discussions on a European Marine Observation and Data Network. (Paragraph 199)

This European Marine Observation and Data Network (EMODN) was mentioned in the EU Green paper on the Maritime Environment in early 2007. The Government still reserves judgement on how this will relate to the numerous existing Europe-wide initiatives to share data, what additional burdens it will place on the UK, and whether it will be fruitful or not. The Government remains of the opinion that this initiative could not be supported until further details are available and particularly on how the initiative will provide any added value over SEIS, INSPIRE, GMES, WISE – Marine, GEOSS, ICES and data bases planned for OSPAR (see response 37 for UK Governments support of the ‘collect once use many times’ principle).

In addition the UK is committed to the EU Marine Strategy which places the burdens on member states to share data and make joint assessments of the state of the seas. This should be developed first and the EC encouraged to look at all the data systems and systems of systems they are proposing.

The importance of studying the polar oceans

39. We welcome NERC’s commitment to the International Polar Year but consider that the additional funding dedicated to the UK contribution is less than generous. NERC must confirm that it will provide sustained funding to IPY projects after the end of the programme. (Paragraph 204)

NERC makes an annual commitment of approximately £40m to Antarctic science and infrastructure every year through BAS, and spends an additional £3–4M on polar research every year through responsive-mode grants. This level of investment compares well with other European nations. The Arctic IPY programme, which started in 2006 and funded four consortia programmes, will run until 2010, beyond the end of IPY.

The UK’s role in polar science

40. The UK effort in the Southern Ocean conducted through BAS is truly impressive and gives the UK a genuinely world-leading position in this area of expertise. We support the continuation of this research focus and the resources dedicated to it. (Paragraph 210)

The Government welcomes this conclusion on the UK effort in the Southern Ocean and notes that this world-leading position has been established through the efforts of BAS and a range of other institutions including the National Oceanography Centre Southampton, the Proudman Oceanographic Laboratory, and UK universities.

41. We recommend that BAS be brought fully within the scope of NERC's marine policy as it affects the research centres. (Paragraph 210)

The transition to new strategy delivery mechanisms, with revised funding arrangements, will allow for improved co-ordination of the marine science national capability and research programmes in all of NERC's Research and Collaborative Centres, including BAS and BGS, and with HEIs..

42. We recommend that NERC identify funding for an expansion of Arctic research in collaboration with other nations which already have substantial presence there. (Paragraph 217)

In February 2007 NERC Council requested a working group be set up to look at the priority areas of research in the polar regions (Arctic and Antarctic) in the context of the new NERC strategy. The group's report is currently being finalised and will inform the development of Theme Action Plans by NERC's new theme leaders. Also, separately, NERC is examining the opportunities for collaboration with other nations, including consideration of access and infrastructure needs. In 2008 NERC Council will be drawing these analyses together to develop plans for its polar science portfolio.

Conservation of marine areas

43. We urge the Government to establish a number of full-scale MPA pilot sites immediately, ahead of the Marine Bill, in order to gather the evidence necessary to develop the science needed to underpin MPAs and to enable the UK to become a leader in conservation science. (Paragraph 223)

The Government is committed to establishing an ecologically coherent network of well managed marine protected areas (MPAs). The UK already has a number of protected areas around our coastal waters (around 180) and has a programme of data collection and survey to identify further sites both inshore and offshore. These sites are designated in order to meet our European obligations, and will help to form the building block of a UK network of MPAs. We therefore already have a fairly good scientific understanding in relation to the current network of sites, and we intend to build on this to inform the development of our overall MPA network.

The proposed Marine Bill will provide the necessary mechanisms to complete our network of MPAs, by allowing Marine Conservation Zones (MCZs) to be designated for features of national importance, including rare, threatened and representative species and habitats. Our nature conservation agencies are developing a scientific rationale for selecting sites and the design principles for a network of MCZs. We are keen to complete the network of MPAs (consisting of both European sites and MCZs) as soon as possible and have received commitment from Natural England to enable a designated network of sites by 2012.

Pilot projects are not considered to be either feasible or advantageous, given the network of existing European sites which provide good case studies, and the need to carry out survey work and data collection before designating further sites (to complete our MPA network). There would also be insufficient time to adequately analyse the results of the pilot sites if the UK is to meet its goal of substantially having a network in place by 2012.

Designation of MPAs in Scotland is a matter for the Scottish Government.

The Marine Bill

44A. We recommend that the draft Marine Bill be brought forward without further delay, despite concerns about Defra's ability to deliver a network of MPAs. We require an assurance from the department as to the speedy presentation of the draft bill and the subsequent bill itself, and a commitment to ensuring that the bill is enacted by the end of the next parliamentary session. We recommend that Defra publish a clear timetable for the bill to complete its passage through Parliament within this timeframe. (Paragraph 233)

The Government intends to meet its 2005 manifesto commitment to introduce a Marine Bill in this Parliament. We recognise that there is widespread support for a Marine Bill to be introduced as soon as possible to address the wide range of issues, including enhancement of the framework for marine nature conservation, set out in the Marine Bill White Paper published earlier this year.

We are committed to publishing a draft Marine Bill as part of the legislative programme in this 2007/08 session of Parliament. We expect this will be in Spring 2008.

Introduction of a Marine Bill to Parliament will be subject to the outcome of public scrutiny of the draft Bill and consideration of the Government's ongoing legislative programme. The Government is not at this point able to give a concluded view on what will form the full legislative programme in the coming session, and Parliament cannot give timetables for the passage of Bills in future sessions.

The Government is looking towards early consultation with the public next year on its draft legislative programme giving both Parliament and the public advance sight of what the Government is planning to bring forward in the forthcoming session. This will be accompanied by a publication outlining the Bills proposed as they stand at that point.

In Scotland, the Scottish Government has committed to consult stakeholders, including the fishing industry, on Scottish legislation for the marine area. Discussions to agree the interaction between the Marine Bill and a Scottish Marine Bill are not yet completed.

44B. We recommend that Defra conduct and publish an assessment of what is needed to enable it to designate and monitor chosen sites. However, this assessment should not be used as an excuse to delay proceedings on the bill: if the department waits until it has all the necessary data, it will never proceed. (Paragraph 233)

The proposed Marine Bill will provide a mechanism for the designation of Marine Conservation Zones (MCZs). The provisions will allow for the selection and designation of

sites that contain species, communities of species or other natural characteristics that best represent the range of biodiversity of UK waters.

The Government will select sites on the basis of the best available evidence and the statutory nature conservation agencies are currently considering the approach to site selection and the level of evidence that would be needed for site proposals. Further details will be made public as this work progresses.

We will carry out monitoring of sites through the UKMMAS. This will ensure the co-ordination and streamlining of marine monitoring and help to establish the current and future condition of our marine ecosystems.

Technology transfer to the commercial sector

45. We commend projects such as EPSRC's efforts to stimulate work in sensor systems where Research Councils have identified a potential gap in the market and moved to address it. We believe that there is greater scope for such activity than has previously been explored and recommend that the Research Councils pursue an active approach to identify areas for technology development in the marine sector. (Paragraph 251)

EPSRC will continue to identify and support broad themes for multidisciplinary research that fill gaps in the research landscape, such as the "Sensors in Extreme Environments" theme, through its normal priority-setting procedures. Marine technology research is covered as part of EPSRC's responsibility to manage its research portfolio and through its interactions with users of such research, in particular through EPSRC's Aerospace and Defence and Power sector activities.

NERC agrees that the development of marine technology is an important factor, and this is recognised in the new NERC strategy where Technologies is one of the seven strategic science themes. NERC supports the efforts of its Research and Collaborative Centres to engage industry in the development of marine technologies, and Technology Development is specifically addressed in the Oceans 2025 programme.

Technology and policy formulation

46. We believe that there is an important role for a marine agency to promote knowledge transfer from scientists to policy formulation. This could include publishing data in an appropriate format and promoting stakeholder engagement. (Paragraph 254)

Promoting the transfer of knowledge generated and held by the Research Base to enhance economic growth is entirely in line with the Government's objective to make the most of the UK investment in science, engineering and technology.

For Departments, science is commissioned for a specific purpose, that of providing evidence on which to base policy development. Communication is an important aspect of the science/policy interface. It is a two-way process; policy needs to be clear as to what the "evidence" needs are and scientists need to deliver the answers in a clear and understandable way.

There are several initiatives that are looking at the science/policy interface. For example, as part of a Commission funded project, Defra has initiated a study aimed at developing good practice in the communication between scientists and fishery managers. NERC and its centres are already engaged in many knowledge transfer activities and ERFF recently published a report on using research to inform policy.

It is concluded that the funders of marine science should take the lead for ensuring that there is effective communication of their science. A potential role for MSCC is encouraging the sharing of good practice between members.

Industry and strategy

47. We believe that the development of marine technology should be an important component of the work of new marine body which should ensure that it engages with industry in developing its strategy and plan of work. (Paragraph 255)

MSCC will ensure that wider stakeholders, including industry, are consulted during the process of developing the marine science strategy.

Skills

48. We believe that one of the key tasks of the new marine body should be to review the training needs required to support marine science and technology in the UK and to propose a strategy for tackling identified shortages. (Paragraph 264)

The Government agrees that skills and training are an important aspect in helping to secure proper development of the UK's marine science and technology capability. The MSCC will need to consider this aspect carefully before adopting an appropriate plan of action. Key stakeholders in this area, including the Research Councils, the Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTA) and relevant industry bodies will need to be consulted as appropriate.

Education and outreach

49. We recommend that the Department for Children, Families and Schools investigate the US programme and other ways of integrating marine science into schools and adopt a strategic programme to encourage the study of marine science-related subjects in UK schools. (Paragraph 268)

The DCSF will look at the work undertaken by the National Science Foundation in the US and other programmes

The national curriculum statutory programmes of study at key stages 3 and 4 are now less prescriptive, having been slimmed down by expressing the content in more general terms without losing breadth, depth and challenge. This provides greater flexibility for teachers, allowing them to adapt their curriculum for the needs and circumstances of their pupils, and allowing the integration of subject areas such as marine science. The new curriculum opportunities section of the key stage 3 programme of study also indicates that the curriculum should provide opportunities for pupils to experience science outside the school environment, to study science in local, national and global contexts, and to

recognise the importance of sustainability. Marine science is one of many areas of science that could address these.

The Government's ambitious programme of work to create an education and training environment that delivers the best in science teaching and learning at every stage will provide opportunities for both teachers and pupils to find out more about specific topics such as marine science through:

- Continuing Professional Development (CPD) opportunities – the Science Learning Centre South east has access to the unique facilities of the National Oceanography Centre. This enables the centre to provide courses that introduce teachers to ocean and earth science concepts suitable for use in the classroom. These can be accessed by teachers from across the nation.
- Learning outside the classroom – through The Learning Outside the Classroom Manifesto the Government wants to enable every young person to experience the world beyond the classroom as an essential part of their learning and personal development.
- Encouraging marine related organisations to link with Science and Engineering Ambassadors programme (a number of marine related organisations are already involved), after school science and engineering clubs, and the STEM careers campaign that will begin in early 2008.

It will be a matter for the Scottish Government to consider education policy in Scotland.

50. We recommend that DIUS and Defra jointly examine the US Sea Grant programme with a view to whether the new marine body could usefully expend funds of its own to encourage marine research in the HEI sector. (Paragraph 268)

The MSCC will not have its own budget for research and will not therefore be in a position to expend funds to encourage research in the HEI sector. Departments commission research at a wide range of research institutes, including universities. To encourage the involvement of university teams in fisheries research NERC, Defra, DARDNI and the Scottish Government this year launched a jointly funded programme, 'Sustainable Marine Bioresources', which required universities to take the lead in preparing bids. Eighteen proposals were received, involving some 30 university teams. Six proposals have been selected for funding with a total budget of £2.4m. MSCC will consider whether other schemes, including the US Sea Grant programme, are an appropriate way of encouraging marine science in the HEI sector. It will be a matter for the Scottish Government to consider education policy in Scotland.

51. We believe that the learned societies have a role to play in outreach work and encouraging greater knowledge of ocean-related issues among the general public and in promoting careers in marine science. We recommend that the new marine body, proposed in this Report, develop links with the learned societies for this purpose. (Paragraph 270)

MSCC will commission working groups to undertake specific studies. Learned societies will need to be included in these working groups as appropriate, building on the links

already established by Departments. Learned Societies will be among the many stakeholders that will be consulted in the course of developing the marine science strategy.

Increasing public awareness

52. The new marine body should be charged with raising public awareness of marine issues, including better use of facilities such as science centres and public aquaria. A focus on extreme environments (space and oceans) would entice young people into science. There should also be a duty placed on the new body to raise awareness of marine sustainability issues so that the general public is accurately informed about the importance of the oceans in their lives. (Paragraph 271)

Departments and their institutes already have a number of initiatives aimed at raising public awareness. For example NERC's Research and Collaborative Centres, including the marine centres, already engage in an extensive range of outreach activities and programmes including "classroom@sea" and the current BAS exhibition about Antarctic life and research hosted by the Science Museum. Defra produces a quarterly publication Fishing Focus which includes a regular section reporting on results from its research programme.

The Government concludes therefore that raising awareness on matters such as marine sustainability is best accomplished by the individual Departments, or Devolved Administrations, rather than a central body such as MSCC.

International organisations

53. We recommend that a co-ordinating committee, within the new agency, be established to bring together UK representatives on all relevant international bodies in order to establish agreed common policy goals and to make optimal use of UK expertise and technology. (Paragraph 274)

Current arrangements are that IACMST's International Sub-Committee maintains an overview of UK Government Policy relevant to the UK's interface with various intergovernmental marine-related agencies. The Committee does not formulate policy but it does provide a mechanism for the exchange of information, allowing policy to be developed. A similar provision will be needed for the future, and MSCC will need to ensure that the sub-committee continues, possibly as one of the working groups that will be commissioned to undertake specific work.

International projects

54. We recommend that NERC examine alternative mechanisms for funding long-term international projects in marine science. It may be that there is also a role for the new marine body here in helping with co-ordination across funders. We also recommend that more funding be made available by NERC or other funders of programmes to enable scientists to exploit the results of international projects. (Paragraph 278)

Facilitating involvement in long-term international projects is important to NERC and the issue will be addressed in the development of NERC's International Strategy in 2008 as well

as in NERC's Theme Action Plans. NERC regards the exploitation of results from all relevant programmes, whether national or international, as a high priority, as demonstrated by its support for data-utilisation in the Integrated Ocean Drilling Programme, for example. Both ERFF and the successor committee to the IACMST, as well as the new RCUK offices in China, India and the US, should be able to contribute to the co-ordination of international projects and the facilitation of UK involvement.

55. We conclude that NERC should continue to fund IPOs wherever possible and should provide direct support and assistance in the early stages of bidding for such offices, as well as during the period of operation. (Paragraph 281)

Continued funding of IPOs will be dependent on budgetary planning decisions to be made in 2008. NERC will continue to assess the appropriateness of its involvement in IPOs against its strategic priorities, and where possible become involved at an early stage with offices whose programmes are a good fit.

EU marine research

56. We believe that the UK should participate fully in the development of marine science and technology under the European maritime Green Paper process and show leadership to maximise the influence of UK scientists. We are concerned that this may not be easy with the Department for Transport in charge of Government policy in this area and we urge full consultation between that Department and those with greater knowledge of marine science and technology. (Paragraph 284)

These recommendations are founded on a misconception. The DfT is not “in charge of Government policy” on the European Maritime Green Paper. With the agreement of all the Government Departments, Devolved Administrations and Agencies concerned, the DfT was responsible for co-ordinating the UK Government response on the European Commission's Maritime Green Paper. The response was developed following a UK-wide public consultation and full discussions between UK Government Departments and the Devolved Administrations. It was also subject to scrutiny by the UK Parliament, before being submitted to the European Commission.

Following the consultation on the European Maritime Green Paper, on 10 October 2007, the European Commission published the wide ranging Integrated Maritime Policy for the EU (“the Blue Book”), for further discussion by Member States (available at: <http://ec.europa.eu/maritimeaffairs>). The development of individual elements of the new European Maritime Policy will be taken forward by the Government Departments, Devolved Administrations and Agencies with relevant policy responsibility. However, for the sake of coherence, it is likely that a central co-ordination point will still be required and the appropriate location of this within Government is currently under discussion.

57. We recommend that the UK continue to work closely with EU to exploit FP7 to the full in the area of marine science. (Paragraph 288)

The Government agrees that there is much to be gained in working closely with the EU to maximise the opportunities available in FP7. We will continue to influence the FP7 work programmes through the relevant programme committees and through communication in other fora with the European Commission and other EU member states. Information and

support will be provided to UK applicants through the FP7UK website, the national contact point services provided by departments, and through the Research Councils sponsored UK Research Office (UKRO) based in Brussels.

Government departments and the Research Councils will continue to participate in European collaborative mechanisms funded by the Framework Programme, including the ERA-NETs in marine research, marine pollution and ocean drilling research, to ensure better coordination of national research programmes across Europe.

A UK marine action plan

58A. We recommend that the UK Government develop a strategy for marine science, setting out priorities for fulfilment in the next ten years and identifying how these will be met. This strategy should be developed in full and open consultation with the science community, the private sector and all those with an interest in the health and exploitation of the oceans, including those involved in education.

Individual departments and the Devolved Administrations have responsibilities for developing their own science strategies. For example Defra published its Science and Innovation strategy in 2005, and earlier this year developed a long-term vision for sustainability in the fishing sector which helps identify the future challenges for fisheries science. NERC has recently published its strategy for 2007–2012, "Next Generation Science for Planet Earth", covering its strategy and science priorities and clarifying its approach to funding national capability, including in marine science.

However the Government accepts that there is merit in developing a high-level marine science strategy. This strategy should not duplicate the strategies of individual departments but will focus on the cross-departmental science issues, especially the need for joined-up programmes, and the need for considering our 'national capability' to support marine science. Agreeing the content and scope of the strategy will be one of the first tasks of MSCC. It will be important to agree the extent to which the strategy will include technology, whether to include UK science undertaken in international waters, and how to cover science that crosses the land, air, sea sectors. Once the strategy has been scoped MSCC will commission the work possibly through one of the proposed working groups. Wide consultation will be part of the process. Scottish Government is currently considering its science strategy for 2011–2016, including marine science.

58B. We further recommend that the marine science strategy be part of a larger holistic strategy or plan for maritime affairs, covering the range of uses of the sea, current and future. The priorities and objectives in this strategy should be underpinned by scientific data and evidence. (Paragraph 304)

This recommendation, which refers to the need to develop a larger holistic plan for maritime affairs, is noted by the Government. However this is more a matter of UK marine policy and is considered to fall somewhat outside the strict terms of reference of the Inquiry which has as its focus marine science.

Developing further clarity on the Government's marine objectives is an important line of work linked to the Marine Bill. Work is underway to develop a suite of high level marine

objectives for the UK Government as a whole. These will clarify the UK Government's current vision of clean, safe, healthy, productive and biologically diverse oceans and seas.

The high level objectives will provide a framework to enable consistency and alignment between marine policy and science strategy and will cascade to more detailed and technical contributory objectives and indicators in the UK's Marine Monitoring and Assessment Strategy (UKMMAS) to ensure coherence of our policy with all of our science and monitoring activities.

The objectives will also underpin the development of a marine policy statement which will provide a more detailed framework to deliver sustainable marine development through a new system of marine planning that will create a set of marine plans for areas of sea (including the coast). This is a fundamental part of the forthcoming Marine Bill and the system's implementation will be underpinned by data and evidence. The plans themselves will take all marine resources and activities within the area into account, as well as outside influences, to develop scenarios of current and future development of that area and the activities within.

Accurate and reflective scientific data and evidence gathered during planning will provide the necessary understanding of the amount, nature and complexity of marine activity in an area, as well as ecological considerations and physical features, to help us ensure we can properly protect areas, for example marine conservation zones, that we need to. During the planning process, the planning body Marine Management Organisation (MMO) will liaise and consult with bodies and organisations with specific expertise or marine related responsibilities, including scientific advisors to ensure that the developing plans accurately reflect their policies, priorities and objectives, as set out in the UK marine policy statement. The Scottish Government is currently taking forward policy development for marine spatial planning and a marine management organisation for Scottish waters.

The Government concludes therefore that while a marine science strategy is necessary and will be developed by the MSCC, a larger holistic strategy or plan for maritime affairs is already being substantially addressed by departments through the Marine Bill process. As with all evidence-based policy making, the development of marine objectives is underpinned by science.

58C. We recommend that the strategies be the day to day responsibility of a new marine agency, an executive body with powers to require the co-operation of Government departments. (Paragraph 304)

As indicated in our response to Recommendation 58A and 58B the Government accepts that there is merit in developing a high-level marine science strategy, and this will be a priority for the MSCC. Our response to Recommendation 58B concludes however that a larger holistic strategy for maritime affairs is already being substantially addressed. Consideration therefore only needs to be given to one strategy, that covering science, and this will be developed by the MSCC.

The MSCC will not be in a position to 'require the co-operation of government departments' nor does the Government consider this an appropriate way of achieving successful collaboration between departments and/or Devolved Administrations. As set out at the start of this response members of the committee will agree how they will work

together through a memorandum of understanding or other form of agreement. This will include joint ownership of the strategy.

58D. At the top of this new structure, we recommend the designation of a Minister for Marine Science within Defra, who should act as the Government champion for the whole maritime strategy. (Paragraph 304)

The Government recognises the case for improving co-ordination and developing a more strategic focus. The reporting arrangements for the new committee will be developed as part of detailed planning work for its establishment over the next 4–6 months, to ensure it has the right levers and authority to be able to deliver.

Key factors that will need to be taken into account include:

- There is no lead Minister for marine policy. Marine policy is the responsibility of a number of different departments, Devolved Administrations and funding agencies. Each of these has specific requirements for marine science, including providing “evidence” on which to base specific marine policies and decision making.
- These departments, administrations and agencies are themselves responsible for ensuring that there is effective communication with stakeholders, developing collaborative links, ensuring facilities and vessels are used effectively etc.
- The funders of marine science are best placed, and should be responsible for, the proper management of their science, including effective collaboration and coordination with others.
- The “marine” label implies a uniformity of purpose among agencies which is not in practice the case. Government agencies address a wide range of different policy issues, which, though they all take place in a marine context and may interact, are no more closely linked than all terrestrial activities and are better managed separately.
- The need to ensure robust arrangements and clarity of responsibilities for coordinating and ensuring coherence in the UK’s overall approach, and to address cross-cutting issues.

To secure the improvement in co-ordination and to strengthen opportunities for increasing efficiency the Government considers that the proposed new Marine Science Co-ordination Committee (MSCC) will be the key vehicle to fulfil this role. Members of the committee will be able to escalate issues through the normal channels to their own ministers. Where there are interdepartmental issues that need to be resolved these can be reported to the relevant Cabinet sub-committee or dealt with under established arrangements for any matter of devolved policy. The mechanism for this and the detailed reporting arrangements for MSCC will be developed as part of planning work for its establishment over the next 4–6 months, to ensure it has the right levers and authority to be able to deliver.

The MSCC might also present an annual report to the Chief Scientific Advisers’ Committee, chaired by the Government’s Chief Scientific Adviser.

59. Under this new arrangement, it would be illogical to leave the Department for Transport in charge of Government policy on the European maritime Green Paper. We recommend that this responsibility be passed to the new marine agency. (Paragraph 305)

The proposals for a new Integrated Maritime Policy for the European Union are set out in the so-called “Blue Book”, published by the European Commission in October 2007, following a year-long consultation on the Maritime Green Paper. The proposals are very wide-ranging and cover a number of different policy areas. These include maritime security and surveillance; labour law; careers and employment; maritime transport; maritime clusters; regional policy; tourism; migration; and international relations, as well as marine science and technology, fisheries, climate change and spatial planning. Although the Department for Transport is currently acting as the UK Government focal point for co-ordinating work on the new European maritime policy, responsibility for negotiating and developing individual policy areas continues to rest with the Government Departments, Devolved Administrations and Agencies concerned.

Annex: List of Acronyms

ARGO

Array for Real-Time
Geostrophic Observations

BAS

British Antarctic Survey

BERR

Department for Business,
Enterprise & Regulatory
Reform

BGS

British Geological Survey

BNSC

British National Space
Centre

CPD

Continuing Professional
development

CPR

Continuous Plankton
Recorder

CSIC

Higher Council for Scientific
Research

DARDNI

Department of Agriculture
and Rural Development of
Northern Ireland

DCFS

Department for Children,
Families and Schools

DFT

Department for Transport

DIUS

Department for Innovation,
Universities and Skills

EA

Environment Agency

EPSRC

Engineering and Physical
Sciences Research Council

ERFF

Environment Research
Funders' Forum

FP7

Framework Programme 7

FMSCG

Fisheries and Marine
Science Customer Group

GEO

*Global Environment
Outlook*

GEOS

*Global Earth Observation
System of Systems*

GMES

Global Monitoring for
Environment and Security

GOOS

Global Ocean Observing
System

HECToR

High End Computing
Terascale Resource

HEI

Higher Education Institutes

HPC

High performance
computing

IACMST

The Inter-Agency
Committee on Marine
Science and Technology

ICES

International Council for
the Exploration of the Sea

EU INSPIRE Directive

Infrastructure for Spatial
Information in the
European Community

IPY

International Polar Year

IROs

Independent Research
Organisations

ISIS

Name of Remotely
Operated Vehicle (ROV)

MAPC

Marine Assessment Policy
Committee

MARG

Marine Assessment
Reporting Group

MCZs

Marine Conservation Zones

MDIP

Marine Data and
Information Partnership

MEDAG

Marine Environmental Data
Action Group

MFMB

Marine and Freshwater
Microbial Biodiversity

MMO

Marine Management
Organisation

MOD

Ministry of Defence

MPAs

Marine Protected Areas

MSCC

Marine Science Co-
ordination Committee

NERC

Natural Environment
Research Council

NOCS

National Oceanography
Centre

PML

Plymouth Marine
Laboratory

POL

Proudman Oceanographic
Laboratory (part of NERC)

PSEG

Productive Seas Evidence
Collection Group

RCUK

Research Council UK

RDAs

Regional Development
Agencies

SAHFOS

Sir Alister Hardy
Foundation for Ocean
Science

SEMTA

Sector Skills Council for
Science, Engineering and
Manufacturing
Technologies

SOLAS

Surface-Ocean Lower
Atmosphere Study

STEM

Science, Technology,
Engineering and
Mathematics (Support
Centres)

UKDMOS

UK Directory of Marine
Observing Systems

UKHO

United Kingdom
Hydrographic Office

UKMMAS

UK's Marine Monitoring
and Assessment Strategy

UKRO

UK Research Office

Appendix 2: Oral and written evidence

Taken before the Innovation, Universities, Science and Skills Sub-Committee on Investigating the Oceans

on Tuesday 22 April 2008

Members present

Mr Phil Willis, in the Chair

Dr Ian Gibson
Dr Brian Iddon

Ian Stewart

Witnesses: Rt Hon Hilary Benn MP, Secretary of State, and Professor Bob Watson, Chief Scientific Adviser, Department for Environment, Food and Rural Affairs, gave evidence.

Q1 Chairman: Could I welcome the Secretary of State for the Environment, the Rt Hon Hilary Benn MP, and Professor Bob Watson, the Chief Scientific Adviser for Defra to this one-off evidence session of the Innovation, Universities, Science and Skills Sub-Committee which is looking at the response from the Government into our *Investigations of the Oceans* report which was done by the previous Science and Technology Select Committee. Could I make a special point of thanking you very much indeed, Secretary of State, for giving us your time, we are particularly grateful to you, and also, it is a pleasure, Professor Watson, to meet you before the Committee for the first time. We hope that you are enjoying your time in the department and that you are as controversial in the department as you were in the States. I wonder if I could start, Secretary of State, to just ask you that basic question. This was a report which actually tried to emphasise the importance of marine science, not only to the UK but as part and parcel of our contribution to world marine science. I just wonder how important it is to the work of Defra? How important is it to you as Secretary of State?

Hilary Benn: It is very important, and I agree, I think the subject needed consideration. I think, if I may say so, it was a powerful report that set out the case for change, and I have got one or two things I would like to say, having reflected further on your report, to assist the committee in the evidence session this afternoon, but, fundamentally, science and our understanding of our oceans and our seas is really important to inform the right policy decisions and, with oceans and seas being about 70% of the earth's surface, we know a certain amount, but, as I think your report demonstrated, there is quite a lot that we do not know, but our understanding of the importance of the oceans when it comes, in particular, to the impact of climate change and the contribution that they can make to understanding what is happening and to dealing with it makes that research even more important than was the case in the past. As you will know, because you looked into it in great depth, Defra funds quite a range of work, but the system, I would say, has not been working awfully well. It seemed to me, if I may say so, you were saying that not everything was getting the

attention that it deserved, that we had not got the structure right, that we needed a marine science strategy and there had to be clear ministerial leadership, and I would be happy to say a word about that now or come on to that.

Q2 Chairman: I think it is fair to say, we were hugely disappointed in the Government's response—I say that in a spirit of friendship—and there seems to be a failure by Defra, in particular, to make the connection between marine science and its importance within climate change. I just wonder why you feel that there was such a lukewarm response by the department to the importance of marine science, there did not seem to be that connection between marine science and environmental change, when we know that you are particularly committed to this agenda?

Hilary Benn: I am not sure, Chairman, that I quite agree with what you have just said. The reason I have been looking forward to this evidence session and, indeed, discussion, if we can handle it that way, because it certainly helps me to do my job, is to understand exactly where the disappointment was. It seems to me, if you look at the key recommendations that you made, one that we needed a marine science strategy, we have accepted it and we are going to get on and we are going to produce one, a recommendation that there needed to be a clear leadership. One of the things I wanted to say to you today on that point, I want to make it clear to the Committee that Jonathan Shaw, as the Minister for marine science, is going to be the champion of marine science, that he is going to chair a new ministerial committee that we are going to establish to oversee the new Marine Science Co-ordination Committee, which is what, as you will know, we proposed.

Q3 Chairman: Will that report directly to the Minister then?

Hilary Benn: It will report to a group of ministers that will be chaired by Jonathan, and, as he said to you when he came to give evidence I think two weeks into the job, just so there is absolute clarity about this, because there appeared to be some uncertainty, he is the Minister for Marine Science, he will chair,

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subject to the devolved administrations being happy with the proposal, this ministerial group. As I read your report, it seemed to me one of the things that you were saying, and I have had my ear bent by one or two other folk in the field of marine science who said, we need a champion, we want clarity about who is leading, and actually when Jonathan and the late and much missed Howard Dalton and Dave King came to give evidence there was a bit of to and fro about the previous IACMST, or whatever it is called, who it reported to, and so I wanted to come to the committee today to say I want there to be absolute clarity. I am saying to you that Jonathan will take that lead, that there will be a ministerial committee, and I think that that responds very directly to recommendation 17 and 58 in your report. The real test of the new committee, given that you said very powerfully that the existing arrangements did not work, is: "Does it address the things that were not working?", and I think it is going to be different from what it will replace in a number of very important respects: one because it will report to ministers, chaired by the new ministerial champion, which is what you said you wanted; it will have a bigger secretariat; all of the members will contribute to its funding; it will draw up and oversee the marine science strategy, which was a central recommendation in your report, and I think that is a very important development. We needed one and we are going to get one thanks to what you have done. It will monitor spend on marine science, because clearly one of the other issues that came out from your work was a lack of clarity about what was being spent, and there has been some to and fro between us, but also there has not, as I understand it, been a kind of regular system for checking how it is going. That is one of the things which this new body will do. I think it will provide us with a better way of dealing with the issues that cut across all of the various bodies that are doing things, because I do not think that you need a central body to take on all of the functions of all the existing bodies, not trying to replicate or duplicate but to fix the bits that are not working, and I hope it will also give a higher profile to marine science, which was another really important message in your report. I have got today, which I could leave with you, if that would be helpful, a note on how we are getting on with setting up the MSCC, because we have not just done a response to you and then gone back to what we were doing before. Colleagues in the department and John Lock, who is also here today, have been working really hard on getting on with working out what this structure is going to look like, what the membership is going to be, how it is going to operate, what its role is, and we have got a note which updates you on the 1 April briefing note that we provided you with previously.

Q4 Chairman: We will come back to that, because I know that Brian Iddon wants to raise an issue on that. That is very helpful, Secretary of State. In terms of resources to actually support the new organisation, there was a real sense when we were doing this particular inquiry that marine science was

very much left out in the cold as far as resources were concerned. Is there any new money which is being applied at all to this area?

Hilary Benn: The MSCC will have a bigger budget than IACMST had previously. Straight up, we have got to negotiate with the other bodies that are going to be represented, including other departments, and what they are going to put into the pot, but it will need more resources to do its work, firstly.

Q5 Chairman: But nobody is going to agree to that, are they?

Hilary Benn: Why do you say that?

Q6 Chairman: We had a session here yesterday with one of your ministers talking about another area in terms of bio-security, and there was a great reluctance to commit even a penny extra anywhere. So I am sort of fighting for this marine community, that there will, in fact, be the resources to deliver what, clearly, you as Secretary of State anticipate is going to happen?

Hilary Benn: I think the answer to your question would be we will know when we see how we go in talking to the other people about what they are prepared to contribute, and I hope that the decision that I have taken makes it absolutely clear there is a ministerial champion, there is leadership, that we are taking on the role that you asked us to undertake in your report. We will give this some oomph and a boost and a higher profile, and your report has certainly done that. Secondly, must say, I was quite struck reading your report. On the one hand, in the evidence sessions, many people saying the UK has a huge role in marine science, the contribution that UK scientists make, recognised around the world, and on the other hand, as in most areas of life, if you say to people, "Is enough money being spent on your particular area?", in general you get the answer, "No, it is not." Clearly, it cannot all be doom and gloom.

Q7 Chairman: No, but you would have also read in that report that some of our best scientists were haemorrhaging out of the UK, for instance, to Germany, which is rapidly expanding in marine science; they were going off to Japan; they were going off to Woods Hole in States. So it was not that we have not got brilliant scientists, we recognised that in the report, but the matter was trying to keep that community together to enhance it so it could play a much more significant role in climate change, which was an absolutely top priority for government. I think we are trying to balance that rather than say that we are weak in this area, because we certainly are not.

Hilary Benn: I agree with that. Bob might want to say something about the science budget that he has got because, having arrived at the department, one conversation that we have had is in deciding where Defra's research budget is going to be spent. We tended to operate a system in the past where it was fairly devolved, and one thing that we have agreed between us is that Bob in his role will look at the overall priorities in relation to what Defra spends,

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and I think the role of the new MSCC will give us, with greater clout and profile, ministerial leadership. The object is to do the same looking at the investment in marine science right across the piece. If you take NERC, which is a big funder, they will still take decisions, and a lot of your recommendations as a committee were directed at NERC. I am not envisaging that the MSCC is going to take on that role, but it will have things to say and it will be able to pick up items that, as your report demonstrated, have fallen through some of the cracks in the system.

Professor Watson: There are two things to say. The first is we are trying to get our hands round the whole research budget within Defra, and so, rather than having it disaggregated between the climate change programme, natural environment, food and farming, we are standing back to ask: what are the big policy questions within Defra and how can we have a much more joined-up integrated programme within Defra? Secondly, there is the issue of how do we view Defra in relationship, not only for marine sciences but all sciences, with the other departments and, effectively, the other research councils? *Living with Environmental Change*, which is the multi-department, multi-research council, I think really gives us an opportunity here. As you know, there are six objectives: climate change, biodiversity, development, human health and animal health infrastructure and an element of behaviour. The oceans, effectively, need to be integrated very much in at least climate change, biodiversity, health and even in the infrastructure, obviously for coastal infrastructure. So, clearly the *Living with Environmental Change* will be critical so we can leverage each other's resources, and Defra is actually going to take the lead with NERC in putting the original programme plans together on both climate change and on biodiversity. We will work with the other agencies and research councils on the other four objectives. We have also got to place this, though, in a European and a global context, especially for monitoring. One of the things that the Environmental Research Funders Forum found was that when they looked to see how we were spending research money, they had a pretty good idea; when it came to monitoring they had no idea at all, and so I have offered to chair, on behalf of the Environmental Research Funders Forum, a study on how we are spending the monitoring money. We really are quite clueless, whether it is the marine environment or the atmosphere or the land, and there is a number of mechanisms which this new Marine Co-ordinating Committee will fit very nicely into as we establish priorities on research and monitoring and see how we can leverage each other.

Q8 Chairman: While you have got the floor, Professor Watson, in your Fleagle Lecture in Washington I think last year you made a fairly strong comment that scientists need to learn to communicate better with civil servants (and you will remember it caused a little bit of a stir at the time), decision-makers and the media. Do you think the perceived lack of urgency up until now, if I can put

that way, of Defra's attitude to marine science was as a result of the science community not conveying their message strongly enough, or was it Defra that was not listening?

Professor Watson: I cannot say, because I only joined six months ago. To be honest, just as Hilary said, I have been lobbied by every part of the community, whether it is the atmospheric sciences community wanting more money, whether it is the animal health community wanting more money, the oceanographers wanting more money, especially with my position at the University of East Anglia some of those oceanographers at the University of East Anglia are lobbying very heavily, and so, as Hilary said, I think most of the academic community will always argue for more money. Where we need the dialogue with the academic community is effectively, from a Defra perspective, what are the big policy issues facing not only Defra but the UK Government? Obviously, some include climate change, but not limited to it, i.e. sustainable fisheries, and so we need a dialogue so they understand the policy constraints and we understand them so that we can put together an academically rich programme with the research councils that meets the needs of the academic research, on the one hand, that the councils do and the more policy-relevant research that we, Defra, need to help formulate policy and implement policy. I think there is two-way dialogue that is needed. Probably there was a weakness on both sides.

Chairman: You will make a politician yet!

Q9 Dr Iddon: Hilary, we talked to a lot of people, of course, during this investigation, including people particularly in America. America does have an operation which oversees all aspects of the sea, whether it be tourism, energy, fishing, shipping, pollution, gaining oil and gas from the sea, climate control and deep sea as well as Continental Shelf work. Absolutely every aspect of the sea is looked at by this organisation in America. When we undertook this investigation, we felt that the whole apparatus that we have set up to monitor all those things was distant from one another, fishing seemed to be way out on a limb compared with everything else connected to the sea, and we made a radical solution in suggesting the Marine Science Agency. I just wonder why we have gone for a much smaller and, we believe, less effective organisation than the Marine Science Agency that we recommended, which would shadow what America has now?

Hilary Benn: First of all, reading your report I was not absolutely clear. You said in your recommendation we need more effective co-ordination and then you said in the recommendation, "Our preference would be for", what you have just described, but it was not absolutely clear to me whether you were talking about a marine science agency or a marine science and maritime agency. I will give you an example of that. I think in the very last recommendation in your report you talked about the EU Maritime Green Paper and said the Department for Transport was not really the right body to look at this, and yet the

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Maritime Green Paper is going to deal with a wide range of things but among the things it is looking at are maritime security, shipping law, careers and employment, tourism and other matters. Question: would it be sensible to have one body that was dealing with all of those things? To be honest, I was not persuaded that that was the sensible course of action to take, bearing in mind the point I made earlier: do not fiddle with the bits that work but deal with the bits that do not work. You also talked about an executive body requiring the co-operation of government departments, which is quite an interesting concept because I thought it was, generally speaking, the other way round, the government departments requiring the co-operation of executive bodies. Lastly, there are all of the complexities to do with devolution that, I think, made it difficult to see how that could work in practice. Having said that, you have got the co-ordinating committee, which was the first bit of your recommendation, with the functions that I have described and which we have set out and which we are getting on and developing, but that is not to say that having a look at wider maritime needs and issues is unimportant, it is incredibly important, and at the same time as this, of course, since you produced your report the draft Marine Bill has been published and you are going to have the Marine Management Organisation and this completely new departure, and a very welcome one, seeking to do in the UK for our seas and, as I have described it, the wonders that lie beneath them what we have evolved over the years for the land in the form of one way of looking at the competing demands on our seas and working out what it is that we are going to do, and the marine management organisation is going to play a really important part in that and it will be represented, when it is established, on the new Marine Science Co-ordinating Committee. I think it is a different way of achieving the objective that you set. In the end we formed the view that it was a better way of doing it than creating a marine science (question mark) maritime agency.

Q10 Dr Iddon: We called it a marine agency, with a view to looking at the wider aspect, the second alternative that you gave when you opened your remarks a moment ago, and that was our intention, not just to take the science into account but everything that affects the behaviour of the sea, what we gain from the sea and how we use the sea. That is what we felt and that is what, I think, Chairman, we picked up by talking to the large number of people we talked to, mainly scientists, of course, but they have a wider outlook than just the science they are doing, including the long-term observations that Bob Watson has mentioned.

Professor Watson: Let me make a comment. The one thing I actually understand rather well is the US system. I used to be the Associate Director for the Environment in the White House, so at that particular stage—this was 11 years ago, I have to be honest—I had oversight for a seven billion dollar a year programme. Actually, most of the research is not done in NOAA; the really good oceans research

is actually done in NASA and the National Science Foundation. NOAA only do the operational part, which is very, very important—do not misunderstand that comment. NOAA do some incredibly important things on the observations in a routine monitoring sense of both the atmosphere and the ocean and fisheries, but some of the most vibrant research is actually done in NASA, the National Science Foundation and the others, and so, again, the way the research works—because I actually helped to put an inter-agency committee together—is very similar to this maritime committee actually, and so the strength of the ocean research embedded within the atmosphere and the land research, which is what you have to look at as the couplet for climate change and even for biodiversity, was actually bringing all the agencies together. So I could argue from a research perspective, not necessarily some of the other fisheries issues, that what we are trying to do here in the Marine Science Co-ordination Committee is not dissimilar to the committee that I helped to put together 11 years ago in the White House to co-ordinate science right across the agencies.

Q11 Chairman: Fisheries are not even part of this.

Professor Watson: No; agreed. That is why I kept my remarks to the research to understand the oceans, including biodiversity, the role in climate, the role in fisheries basically. The pure science behind the marine system in the US is highly fragmented, well, relatively fragmented and so even there you need an inter-agency committee, very much like one is suggesting here.

Q12 Dr Iddon: We picked up strong criticisms of the existing IACMST organisation, which the people we talked to felt was not co-ordinating all the work that needed co-ordinating and, indeed, had very little powers, for example, of compulsion and very little effect on the behaviour of the Government. They felt that IACMST was an extremely weak organisation, but it did have a wider membership than what the Government is now proposing to set up with the new MSCC. For example, there will be no industrial membership, as far as we have been told, on the new MSCC and the research councils do not appear to be playing a role. Why have we chosen a much narrower body? It may have stronger powers, as you indicated, Hilary, at the beginning, but it is a narrower focus than the existing organisation of which we have received, let me repeat, strong criticisms, not of the people who operate it, by the way, but just of the structures and the way it operates.

Hilary Benn: I agree with the criticisms that the committee made. That is why I accepted your recommendation that we should have a new co-ordinating body. What is different about it is what I described in answering, Chairman, your original question. It might be helpful. In this paper, which has got a bit more detail, which I will leave or circulate now, whatever is most helpful to the committee, the proposed structure, “Members of the MSCC will be at director level, representing the

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following departments and agencies: Defra, BERR, MoD, DfT, DIUS, NERC, devolved administrations, Environment Agency, DFID. It will be supported by a support group with representatives of departments and agencies who have got direct science budget responsibility. In addition to the departments and agencies represented on MSCC, the support group will include representatives from the Met Office, CFAS, UKHO, JNCC, FRS." On the very specific point that you raised about other membership, we are planning, if you like, three independent reps, because I know that has been an issue that has been raised, one coming from the academic world, one from fisheries and industry, which I think picks up the point that you made, and, say, one NGO. We have not quite finalised the decision there. The purpose of giving you the note of the planning group that has now had two meetings is for you as the committee to have a chance to look, and can I make this offer now? If you have got views, which I am sure you will have, about what you think of the membership, could you give us a shout, because we have not set it in stone yet, we are evolving the process, the organisation itself, and I want it to work effectively, to hang on to the good things there were about the previous organisation, not to lose that, but to deal with the bits that were not working, which is why we accepted your recommendation to establish a new co-ordinating body.

Dr Iddon: I think we could say right now, Chairman, could we not, that the balance is so much in the public sector favour that the private sector was very disappointed to learn about the new MSCC. You just mention one industrial/something else amendment. I think if you put that to the private sector, they will be even more disappointed, bearing in mind that the sea is going to be used much more in future, if we exclude shipping and fishing, by the energy sector—for example, off shore wind farms, wave and tidal machines—that part of the use of the sea feel that they need to be represented on this body.

Q13 Chairman: It is also the university community as well which are ignored. So the whole of those three communities. The private sector, if you like, the BPs of this world, who are huge players in marine technology, marine science, the technologies which Brian has just mentioned and the universities are three communities which we felt strongly should be part of the agency or, now, the new committee which has been established.

Hilary Benn: I agree with that, and that is why the three reps that we are currently thinking of in the working draft that we have produced responds to that. The other point I should have made is, of course, do not forget the marine management organisation: because as you came on to the last points that you made in responding to my answer, that is what the Marine Management Organisation is going to be dealing with and it will only be able to do its job if it is supported by and involves and talks to all of the interest groups that you have just drawn attention to. One of the striking things about the Marine Bill and the concept of the MMO is, I have

to say, the very wide level of support there is for it and the welcome there has been for the bill, not because people think, "Hey, we are being left out of this", but actually because I think they recognise it is long overdue, it is groundbreaking, it will do something for the seas that we have never done before, and, in effect, it is a means of trying to mediate between all of the competing demands on our seas, which are growing for the reasons that you have set out, so that we have a way of taking decisions about how the seas are going to be used and at one end saying, "Right, this is so is special and precious, nothing can go on here"—that is what marine conservation is about—but it is a flexible instrument because you can go from no activity to not some activities, so you have got a flexible means of protecting what you need to protect, but there will also be the mechanism for determining where you are going to give the go-ahead for wind farms, and so on and so forth. If I may say so, I think you need to look at the two things operating together, because we have accepted, I hope you will feel in the spirit of what you are asking for, a different structure for doing it, the MSCC here dealing with the marine science, which is what your report was principally about but not exclusively, and then the Marine Bill and the Marine Management Organisation over here, remembering, of course, that one of the things that will govern the work of the Marine Management Organisation is the Marine Policy Statement which the White Paper and the bill commits us to draw up, which will give us the place to put---. In a sense, it will do what you have asked for the Marine Science Strategy to do for marine science. The Marine Policy Statement will do the same for what is the policy framework for deciding what is going to happen in our seas and underneath them?

Q14 Dr Iddon: Will we have a bridge between those bodies or a valley separating them?

Hilary Benn: I said a little moment ago that the MMO will be represented on the MSCC, because it has obviously got to have the connection, and, to be honest, the other way round, that is something I will go away and think about.

Q15 Dr Iddon: I have one last question, which is quite simple. When will the new organisation, the MSCC, be up and running, Hilary?

Hilary Benn: If I can refer to the note here, the next meeting of the planning group will be on 15 May, and then Defra will invite MSCC members to a first meeting in June or July to examine the planning group paper in detail, confirm the structure, develop a forward plan of action, consider the shape and content of the strategy. So we are getting on with it, and that is one of the points I wanted to get across to you today.

Q16 Chairman: Do you have a deadline for when you want to see this completed?

Hilary Benn: To be honest, as soon as possible. The fact that we are making the progress that we are, I hope, will encourage the committee that we have

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taken the recommendation, we are getting on and we are going to make it happen, but I cannot say I have got a tenth of whatever.

Q17 Chairman: But if by the end of the year it is not firmly in place, which this piece of paper says—

Hilary Benn: I certainly envisage that the MSCC---. No, that is not what that bit of paper says, but I certainly envisage that the MSCC will be operational by the end of the year, and you can come and tell me off if it is not. That I will make as an offer to the committee.

Professor Watson: And that timing would actually be good, especially if we can make it earlier. There have already been two planning meetings so far of the planning committee. The third one, as you hear, is going to be actually in a few weeks time, because we hope to have some draft initial strategies for LWEC (*Living with Environmental Change*) by about the middle of June, so I think all these things are moving together. As I said earlier, I think we have to place marine science, important in its own right, in the context of all these other issues on the land and in the atmosphere as well.

Q18 Dr Gibson: How will I know when we have got a marine strategy? Where would I first see it and how would I first find out, and what is it anyway? John F Kennedy had a strategy: it was to get a man on the moon at the time, and I guess he did that, but that was a strategy. How precise does a strategy have to be before it convinces cynics like me that you have got one?

Hilary Benn: I never had you marked down as a cynic, Dr Gibson. The answer to the question is that we aim to draw it up so it is available in the second half of next year.

Chairman: The second half of next year?

Q19 Dr Gibson: Two thousand and nine?

Hilary Benn: Yes, 2009.

Q20 Dr Gibson: So why does it take that long, Minister?

Hilary Benn: We are talking about a year and a bit. I would not say that was that long.

Q21 Dr Gibson: Who is talking about it then?

Hilary Benn: There is a sub-group of the MSCC which is starting work on how this is going to be put together. We would want to publish it in draft, because I am a great believer in doing it that way. That is the final publication, just so you do not look too perplexed. So you would want to get a draft out, obviously, earlier than that to go round all of those who have an interest to allow the answer to the question that you put to me to be given, say, "Okay folks, what do you think of this? Is it what you think a marine science strategy ought to look like?", and then the result of that consultation can inform the final publication of it. That seems like a reasonable time.

Q22 Dr Gibson: I guess you and I are living with the anomaly of the Post Office consultations at the minute. There have been decisions made, three months or three weeks, whatever it is. During that consultation period, how long is it going to be and how serious would you take it, you know, when people from the University or East Anglia, or wherever, want to come in with their ideas, which may be sharp and bright but they do not fit in with the political scenery?

Hilary Benn: I do not know, is the answer to your first question. We will have to decide what a sensible period for consultation is. Secondly, I can only answer your second question when people feel, or do not, that what they had to say in being asked for their view is reflected in a final document. Certainly the spirit in which I would want it to be done, and I know that certainly goes for Jonathan in chairing the ministerial group, is one of openness, but you just have to test it.

Q23 Dr Gibson: Do you think the marine scientists are as passionate about all this as people who are having their post offices taken away from them in Yorkshire in your experience?

Hilary Benn: It is an opportunity to express that passion. After all, you talked to lots of marine scientists in the course of taking evidence for this inquiry and what a number of them said to you was, "We do not think", as I said to you earlier, "we get the attention we deserve. We are not as loved as we feel we ought to be." Here is a wonderful opportunity to get across to a wider audience why marine science matters. That is why you made the recommendation that we should have one, that is why we accepted it and that is why we are going to get on and do it.

Q24 Dr Gibson: Do you as a minister think it is more important to have that interaction with the public and marine scientists, and so on, that just cross-departmental interactions? You could argue that you believe in both.

Hilary Benn: Both, because you need all of the people who have got an interest to have a chance to shape it. Part of this goes back to Mr Iddon's question about the representation on the MSCC, because it is going to be overseeing this process, so you want the right people feeding in in the drafting and the preparation and then the consultation. Bob.

Professor Watson: There are two points I would make. First, as we put a marine science strategy together we have got to place it in the context of what else is going on in the European Union and globally, especially for monitoring, but we have also got to place it in a context of what is the problem we are addressing. If it is climate change, you can have a lot of people advocate for the marine part of it, or the atmospheric part, or the land part. Our job actually in both government and working with the scientific community is what is the right balance to actually get the answers we need on climate change? To what degree do we need more marine research versus more understanding of clouds, water vapour in the atmosphere, the exchange of energy and

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chemicals between the atmosphere and the ocean, et cetera. So, one of the things we are going to have to do, and I think this is where *Living with Environmental Change* will be a good platform and all the objectives, we need to evaluate what are the highest priorities from both the scientific and policy perspectives for the UK and how do we put that balanced programme together, of which marine is one element? A bunch of people, scientists, came to see me arguing, "Why did we not have more carbon dioxide atmospheric measurements in the UK?" We do not have them. We have only got one in Ireland. They said, "Do I need more as a policy-maker or as a scientist to understand atmospheric carbon dioxide in the atmosphere?" No, but the UK community said, "But we do not have any measurements, Europe does, North America does", so we do have to place what we are doing in the UK within a European global context because we cannot fund everything. We are one of the world's leaders in, say, the Hadley Centre, in theoretical modelling. Many other countries do not have a theoretical model. So we do have to look at the balance, basically, of what we can do versus what others can do, and marine is a major element within that broader framework.

Q25 Dr Gibson: When you look at other countries, like the USA, where you have been, and Portugal, and so on, what have they got to teach us, do you think, in your experience? You have been around a long time in this field.

Professor Watson: I think all of us need to understand how to get a truly integrated multi-disciplinary holistic programme that is both academically rigorous and policy relevant. I think all programmes that I have seen to date actually lack something very fundamental, and that is adequate attention to the social sciences and behaviour, to be quite honest.

Q26 Dr Gibson: What does that mean, Bob, at the grassroots though?

Professor Watson: We have got to embed more social researchers into our programmes to understand social behaviour at the individual level, the community level, the private sector, the non-state actors, and it is actually a cheap form of research, I have to be honest, compared to when you are in the natural sciences you need ships or satellites, et cetera. It is a relative statement, of course, but I think we are moving in the right direction—do not misunderstand me—and the right direction is multi-disciplinary, inter-disciplinary science that is, indeed, policy relevant and academically rigorous at the same time. We actually need to get the cultures of Defra and DFID aligned, or agencies, or departments such as that, with the culture of the research councils, and there is some cultural change that is needed. NERC tend to look at the natural sciences, the ESRC look at the economics and social sciences, EPSRC the physical side. Like us, they have to think much more multi-disciplinary. The sciences have to learn to talk to each other, basically, and so I am not sure anyone

has quite got there. Both in the US and Europe, we are all learning together about what works and does not work actually.

Q27 Dr Gibson: Can we leave it to happen spontaneously, those interactions? Is there going to be some inducement?

Professor Watson: No, it has to be induced. Clearly, as we develop LWEC we have to have interactions with the academic community. One of the best ways to understand what the academic community believe are priorities is through entities such as the Inter-governmental Panel on Climate Change, where they have assessed the knowledge and have actually said what we know, what we do not know, what is policy and where the big gaps are. The Millennium Ecosystem Assessment, I had pleasure of chairing, also looked at what we knew about ecosystems, biodiversity and where the gaps were; the International Agriculture Assessment I directed that we release last Tuesday looked at the role of agriculture within both an environmental and a social context. In each of those cases hundreds, if not more than a thousand, scientists participated, so they not only evaluated knowledge, they also identified what were robust findings and what the key uncertainties were, but this is a continuum. Defra actually about two years ago organised, before I joined Defra, the Exeter Meeting, which was a very powerful meeting identifying the key uncertainties and provided information to Defra. We have actually just commissioned, about three months ago—a report will come out—what were the major implications of the IPCC for scientific uncertainty? So Defra put out a small contract. It has actually reached out to many, many in the academic community. So, no, it is always a two-way street.

Q28 Dr Gibson: Do you think this is a new world for the United Kingdom science-base?

Professor Watson: No, I think the United Kingdom actually, other than the US, is probably the leader in much of this. I would actually pick three countries in the world. It would be the US—they are larger, just the sheer size, to be honest—but the UK I would either put second or co-second with Germany in this field.

Q29 Dr Gibson: Do you think the public or the Government know this?

Professor Watson: The public may or may not know it. That is a fair point. The scientific community know it all too well. You only have to look to see what is the percentage of academics that have been involved in either the IPCC, the Millennium Ecosystem Assessment or the International Agriculture Assessment, and proportionally it is very high. It really does demonstrate leadership within the UK.

Q30 Dr Gibson: Is there anything in the European dimension that we could learn about, areas that are not touched upon in Europe that we could take up and have a priority influence on? Transport?

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Professor Watson: I have not looked at it carefully enough to give you an informed answer. I would have to look at that more carefully, to be honest.

Q31 Dr Gibson: Do you think there might be?

Professor Watson: We cannot be leaders in everything. As General Electric said, they could only be as a business either the first or second best in the world, otherwise as a business they did not get out. I think we all make too many mistakes by being absolutely broad and trying to do absolutely everything rather than pick certain things and go into absolute depth and be true world leaders. With the budgets we have got, which are clearly generous, we cannot be the leaders in everything; so what we have to do is place our research programmes—that is the UK, not just Defra—in the context of the US and Japan to some degree and see where we place it basically.

Q32 Dr Gibson: Have you got a list of five things somewhere under your pillow, for example, where you could achieve, in your opinion, very quickly, five, ten years, or whatever, rather than trying to do everything?

Professor Watson: Sure. Improve probabilistic forecasts at the spatial level that we need for impact and adaptation studies in climate. I think the Hadley Centre is as good, or better than, anyone in the world. The only challenge there is a significant need potentially for a super computer to go to that next level. You also need some underlying science to make sure you have got the physical and chemical processes. I would say we actually are equal and we can be the world leader with the right investment. I would argue in biodiversity actually promoting the ecosystem approach, which comes out of the Millennium Ecosystem Assessment that Defra announced, would be a world leader in showing how we could have multi-function agriculture, that is increased productivity, and at the same time making absolutely sure that we are protecting our environment and we recognise all the other attributes. They are two that hit me absolutely immediately where we can be world leaders.

Q33 Dr Gibson: Are the training processes getting the people coming into them that we need to carry out those intentions?

Professor Watson: I cannot give an answer to that. I would need to find out. We need to look at, effectively, human capital and to what degree are we investing adequately in that next generation of scientists, but that is something I have not personally looked at.

Hilary Benn: Could I add, very briefly, one thing? It seems to me that the recommendation you made that we have a marine science strategy provides the opportunity for all of the things in the questions you have just asked, Dr Gibson, to be reflected upon, and what an opportunity actually. I would I hope that the scientific community would be busting a gut to say, here is a chance—to go back to your question

about how many people understand—to tell the story. Actually the Marine Bill also gives us an opportunity to do the same thing.

Q34 Dr Gibson: The scientific community cannot provide the resources. Government has to provide those resources for that to happen.

Hilary Benn: Indeed it does, but the act of drawing up a marine science policy, the fact that it will come out in draft, that there will be a chance for people to express a view, argue, debate, discuss—that is the purpose of it. I have not got one tucked in the corner that I wrote earlier and I am just going to bring it out according to a timetable. This is a process. You have started, and I want it to be a success and so do you.

Q35 Dr Iddon: When we made our recommendation of setting up a marine agency, which your department rejected, we consulted widely about that, of course, over a period of a year. Instead, you have set up, or you are setting up, an MSCC organisation. Can I ask you how widely you consulted before you came to that decision and, secondly, in setting up the new marine strategy, who are you expecting to consult? Are you consulting all the stakeholders? Will they get a chance to shape that strategy?

Hilary Benn: The answer to the first question, Dr Iddon, is that we reflected within government but we did not go through the same process that you had gone through in talking to lots of folk about it. Having read your evidence sessions, there were some people who came and gave evidence who were not entirely persuaded that that was the right thing to do, but the reason why, in the end, we reached the view that we did is the reason that I set out in answer to your earlier question: both because it was not absolutely clear to me what was being sought but also because we had already embarked, with the Marine Bill White Paper, the creation of the Marine Management Organisation, on a course of action and I think we need that body to deal with what the Marine Bill is seeking to do and, I will be very frank, I was not persuaded that the right thing to do was to put all of that together in the way that it appeared you were suggesting, but I think we achieved the same objective by having the Marine Management Organisation over here doing the work in relation to the Marine Bill and the MSCC over here doing the things that you asked for, including drawing up the Marine Science Strategy. The view across government was that this was the right thing to do, and your recommendation said we want better co-ordination, and our preference was now. That was the way that you chose to phrase it, and we have thought about it very carefully. I hope you will feel, on reflection, what we have done is not a rejection, we do not accept any of this. Not at all. I think it is a different way of achieving the objective that you set out very, very clearly in your report.

Q36 Dr Iddon: I think what the stakeholders who are listening to this discussion want to know is whether, now, having rejected that first proposal, your

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department is going to consult widely about shaping the strategy. Can we have an assurance about that today?

Hilary Benn: Absolutely.

Q37 Chairman: Before you answer that, and it is also why the membership of the MSCC is so important if that, in fact, is going to be, if you like, the body that actually brings the strategy together.

Hilary Benn: I accept that completely. The reason that I have brought the bit of paper along today, which I will leave with you, is precisely because we have had two meetings of the planning group trying to work out what this thing is going to look like, and when I say today (and this is a genuine offer) if as a committee you have got views, having read that bit of paper, about what you think the balance of representation looks like, would you please let me know and I promise to go away and to think bit. Again, this is not a process that we have gone away with a towel over our heads and said, "Right, we have got it all sorted." We are in the process of working it out, we wanted to demonstrate today that we are getting on with it having accepted your recommendation, but it is not finalised in stone, so, please, let me know what you think about how it is evolving, and that is the purpose of the note.

Q38 Dr Iddon: That is not an answer to my question. The question was can the stakeholders out there be assured today that in shaping the strategy you are going to consult them?

Hilary Benn: The Marine Science Strategy. Yes, I am sorry, I thought I had made that clear in answer to the earlier questions, Dr Iddon.

Dr Iddon: Sorry to press you.

Q39 Chairman: Just before we leave strategy, I was very struck, Professor Watson, with your comments that we cannot do everything, and I think this committee would accept that and that we are also part of a European, a global network and, if you like, the deep-ocean drilling, the ARGO float, was a classic example of where things are done much better on a global basis. Could you give us an assurance that the new strategy, as it emerges, will not in fact be enough layer on top of a host of smaller strategies within departments or organisations but will, in fact, be sweeping up everything into a single, straightforward strategy which actually drives this whole agenda forward: because there is nothing worse than simply having yet another layer on the cake?

Professor Watson: No, we need to start with what is our vision for the oceans and how is that placed within the whole earth system. What are the objectives of the research that we need, whether it is better understanding of climate change, better understanding of the oceans' biodiversity, better understanding of sustainable fisheries. So we need to step back, ask what our vision for the oceans is, ask what the big questions are that we are trying to understand, ask what research we already have—what do we already know, what are the research gaps, what is needed to fill them—and then we must

place that within the overall context of what is happening either within Europe or within the United States, and I think that is especially important for the large observational programmes, which are phenomenally expensive. Even the US cannot afford to do all the measurements. I have not been in government now, obviously, for 11 years—I was in the World Bank—but it is quite clear, especially when you try to do significant observations from buoys for ships or from satellite observations, it is extremely expensive, so some real priorities have to be set, and it has to be set on what are the scientific questions you are trying to ask and answer.

Q40 Dr Gibson: Just to make clear in my mind a conversation I had which was very similar with Arnold Weinstock of GEC many, many years ago, when there was rationalisation taking place, which was not a word they used then. I guess any new strategy could involve rationalisation of some sort, restructuring, job losses, job creation even. Would all that be part of the equation too? We cannot rule out the fact that it is very much an important part of consideration during consultation stages.

Professor Watson: I cannot give you a direct answer to that, I have not been part of the planning committee at the moment, John Lock has been chairing it on behalf of Defra, but what I normally find in all research programmes is that they evolve over time. In other words, with or without a new marine strategy, the type of research that we would do within the marine sciences, or the atmospheric sciences, or the biological sciences would naturally evolve over time as individual questions are answered, so you would actually want to have a smooth transition from the research being done today to the research that would be needed under a new Marine Bill. You would not want dysfunctionality in the academic community or in the private sector, you would want to finish of the pieces of research being done now, and, as we all know, it is always an interesting combination of Blue Sky academic research and very policy-targeted, because you are never sure when you are going to make those scientific breakthroughs, and that is going to be the interesting balance, trying to balance some thing that may look academically interesting but may not be so policy-relevant—which is why we have research councils—and at the other end of the spectrum some very policy-relevant research we already know we want. It is actually betting that balance that is always a challenge.

Q41 Dr Gibson: Would you say that British science now is moving away from the fragmentation stage into the centralisation of scientific endeavours, taking away all the small units and putting them into one? Is that a pathway you see happening?

Professor Watson: What I see with LWEC is clearly that the research councils and the departments are trying to come up with a more holistic strategy where we can appropriately leverage each other. What I would hope is, as those strategies are developed, they will have an appropriate balance between

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fundamental and academic science and policy-relevant science. One is seeing a movement in some cases towards what I call large and multi-disciplinary teams. The Tyndall Centre would be a perfect example, and it is a consortium of seven universities. I see it is that type of consortia, whether it be for climate change or for some of these other issues, that is the way to bring together excellence across the United Kingdom, so bring those skills together as needed to address specific problems.

Q42 Dr Gibson: But before you have all the confrontation, if that did kind of happen, a centralisation, it is essential that you have the people in the policy-making arena right from the beginning rather than being dragged in screaming, carrying placards late on.

Professor Watson: Sure; absolutely.

Chairman: We are not carrying any placards here.

Q43 Ian Stewart: Good afternoon. I am absolutely fascinated by the implications of this subject and the wider environmental issues. I did not realise before coming to this just how important this is. Having said that, Bob, before you answered Ian's last question you were talking about what the big questions are. In the introduction to the draft Bill it refers to the need for research, as you highlighted, to underpin Defra's ability to make good policy and good management decisions. I want to press you a bit more on that, if you do not mind, but the first thing I would like to ask you is when will the Marine Bill be enacted?

Hilary Benn: We have got the Bill in draft now for pre-legislative scrutiny and it is subject to the normal processes, the Queen's Speech and, since the innovation of last year, the draft Queen's Speech, and just watch this space, I think is the answer to the question.

Q44 Ian Stewart: A year, a year and a half?

Hilary Benn: We have a very clear commitment to enact the bill in this Parliament, and we intend to do so.

Dr Gibson: Has the Prime Minister agreed to that? Do not answer!

Chairman: It will be done before 2010.

Q45 Ian Stewart: I think also, Bob, you, by inference, accepted that there were gaps in the data that is needed to make the proposals in the draft Bill work. Is that right?

Professor Watson: Let us be quite candid and let me pick climate change as a particular issue. There is a huge amount we know and, as we all know, it is a clearly serious environmental development and actual security issue, and we clearly know enough that we must, indeed, mitigate greenhouse gas emissions to try and limit the projected changes in climate. Having said that, there are still some fairly significant uncertainties, whether it be in our understanding of the oceans, ie one good example would be what are the implications of the acidification of the ocean? There is more carbon dioxide being taken up by the ocean. What are the

implications on marine life in the oceans and biodiversity? The fact that ocean temperatures will change and ocean circulation patterns will change will mean there will be different patterns of nutrient flows. What will happen to fisheries there? It could be that simply the fisheries move; it could be there is a decrease in total catch. So, no, there are some significant questions, especially what are the implications of climate change on fisheries, agricultural production, human health, natural ecosystems, and how can we adapt to them? So, there are uncertainties in the marine science, the atmospheric science, our land science, and it is trying to get the priorities right across the earth's sciences of what are the most important policy questions and how do we get the answers to those important policy questions. One of the key issues is the exchange of energy and chemicals between the atmosphere and the ocean? To what degree will there be changes in storm surges in the oceans? There is a number of questions.

Q46 Ian Stewart: Those are very interesting questions, even to lay people like me, but are you confident that Defra's own research programme would be sufficient to fill those gaps?

Professor Watson: No, not a hope, and nor will the UK's programme, nor will the EU's. This is why I do stress, especially for an issue like climate change, we have to take a truly global perspective to see what research is needed. Again, I hate to hark back to a previous job I had, but even 11 years ago within the seven billion dollar budget of which I had macro-oversight, not day to day oversight, the climate change programme was fairly close to one and a half to two billion dollars a year then. It is probably comparable now. So we have to place not only Defra's research but the UK research within this wider context, and that is why we need collaboration and partnerships. Defra alone could not ever hope to understand the earth's system, even major parts of it.

Q47 Chairman: To clarify, you have identified within the draft Bill that there are gaps in the research which we must plug in order for that bill to become an effective piece of legislation. The question we want answering is: are you confident that Defra has the resources to be able to plug those gaps?

Professor Watson: Defra has to place its research programme in the broader context of the UK at least. NERC funds far more ocean research than Defra. In other words, we should not say what will Defra's role be.

Q48 Chairman: I am sorry. There is no point in having a bill, is there, if in fact you know from the start that you cannot in fact deliver its objectives, because you cannot plug the gaps in terms of research?

Professor Watson: Okay. I have often testified in US certainly and the US House of Commons and they always used to ask me: "If I give you so much money, how many years will it take you to plug those research gaps?" I always refused to answer. You can put funding into research; you never know when the

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answers are going to come out. All we can do is make sure that we identify the key gaps, identify the best researches and hope that science will follow a reasonable evolutionary course to produce answers. You can never guarantee answers, in my opinion.

Hilary Benn: I would not say that was an argument for not coming forward with a marine bill.

Ian Stewart: If you could come forward with the Marine Bill, you must have some idea of how much additional investment you are going to make to plug these gaps, surely, even at the level that the UK can do on its own?

Q49 Chairman: The bill does not mention research; it virtually ignores it.

Hilary Benn: Clearly the decisions that we as ministers will take---. For example, let us talk about marine conservation zones. The decisions that we will take, on advice—

Q50 Ian Stewart: I am sorry, are those the same as the marine protected areas?

Hilary Benn: Yes, they are called marine conservation zones in the bill. The decisions that we will take, on the advice of the JNCC and Natural England, based on the knowledge that we have currently and the knowledge as it evolves in the way that Bob has described, will allow us to designate more areas as marine conservation zones. As you will know, it is currently 2.2%, I think, from memory. Studies have been done which have suggested it should be about 20%. The MCZ is a flexible means of doing that. You can have what other people have called highly protected marine reserves, but the MCZ is an instrument which can give you as much protection as anyone can possibly imagine over here, a different type of protection here and a bit of protection here, depending on what the nature of the seas are and what it is that you are trying to protect. If the argument was, until you have guaranteed enough funding to answer all of the questions—and I am not saying you are advancing it—there is no point in bringing forward a marine bill, I would not agree with that because I think we need what the Marine Bill is going to provide, but it is going to have to be informed by the science and the purpose of all of this discussion, and the purpose of the science is to find out the answers but to inform policy.

Q51 Ian Stewart: Why I am pressing these questions about funding in that sense is I think, Bob, earlier, as an aside in relation to another issue, you talked about the ability to get research on the cheap and, therefore, it is difficult for us as a committee to scrutinise just what your plans are within this bill if we do not have any idea of the sort of investment that you intend to make, at least at the UK level, to address those gaps?

Hilary Benn: I am not sure that I agree/understand. The bill will do what the bill sets out to do, in the way which the draft Bill describes. We have a certain amount of knowledge currently. That will be drawn upon by those who will advise ministers. Since we are talking about marine conservation zones, part of

what we need to do is to provide resources to look, to understand better what is down there currently—that is what we are talking about, because we have some knowledge but not all the knowledge that we do need—but that is going to be a process over time. I would not see it that you hold up either scrutiny of the draft Bill or the enactment of the bill whilst saying, until you can say here is X amount of money which is going to deliver Y results in terms of knowledge, until we know that, we do not think you should get on with it, because actually people have been pressing us to get on with it and we waited a long time for the bill.

Q52 Ian Stewart: The problem you are posing for me personally is that, in terms of filling the gaps in research, Bob accepted that Defra's own research base could not possibly cope with it. There is a need to work with others externally.

Hilary Benn: Fine.

Q53 Ian Stewart: But he then took it to a global level, saying that even the US could not fill those research gaps. I then brought it back to UK level that relates to this bill, and if you accept that there are gaps that need to be filled, there must be an understanding of what those gaps are and how, within this bill, you can fund the research to cover those gaps. That is what I am seeking, to get an idea of what will happen in practice on the ground.

Hilary Benn: Defra can certainly set out—and Bob says he is going to have overall responsibility for it—what Defra's research budget is going to be spent on. The MMO, as I said earlier, is going to be represented on the new Marine Science Co-ordination Committee. One of the things that the Marine Science Co-ordination Committee is going to look at is where are the gaps, seeing what everybody is up to currently, and if the MMO says, "Here are some things that have been really useful for us to know, and the JNCC and Natural England, in advising ministers on where there should be marine conservation zones and of what type and what it is that we are trying to protect", then that is part of the process. I am trying to provide an answer to the question that you have quite properly asked. It seems to me we are in a better position to do it now, and will be in the future, because of your recommendation that there should be a co-ordinating committee that is more effective, with ministerial leadership, and the fact that the lead minister, the champion, for the Marine Science Co-ordination Committee and for the strategy is also the minister in Defra who has been leading on the Marine Bill, I hope, will also give some comfort and the two bits can live together, but Bob may want to add something.

Professor Watson: I think we always manage the environment, whether it is the marine environment, whether it is the terrestrial environment, or whether it is the atmosphere, with current knowledge, which is why we call it adaptive management. You use the best knowledge you have today, so it is always decision-making under uncertainty, and you continue to do research to try and reduce that

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uncertainty. We have a Climate Change Bill that talks about mitigating climate change, we have uncertainties, but it does not stop us coming up with a well thought through, cost-effective plan to reduce greenhouse gas emissions. It talks about adapting to climate change in the UK. Again, there are some uncertainties, but again that does not stop us coming up with a well-defined strategy that would continuously be informed by further research. Our job is to think through where are the most important research gaps that we should emphasise to reduce those largest uncertainties, which are, on the one hand, the most policy-relevant uncertainties, and so it really is adaptive management where research continuously informs.

Hilary Benn: One of the things we are doing through our research spend is to look at it and ask precisely the question that you have asked of me: what is it we need for the purposes of the implementation of the Marine Bill so that it has an impact on where we prioritise the expenditure that we have got? Perhaps I should have said that at the beginning.

Q54 Ian Stewart: So we agree there is a question, but there is no answer to it at this point in terms of finance. Then perhaps, Bob, you would say what work has been done so far to establish the mechanisms to facilitate the release of data, the interaction between producers, suppliers and users of marine data?

Professor Watson: Clearly, the Marine Bill will be implemented on the knowledge we have today, whether it is knowledge that has come from Defra research or other research entities or the private sector. I think we need to make sure we have all the relevant information up-to-date, peer reviewed, validated, as much as you can validate research findings, as we start to manage the system. This would be the normal way of business actually.

Q55 Dr Iddon: When I visited Plymouth I got the distinct impression that we did not know too much about the areas we need to protect, except in the case of some well-known examples; yet we are putting off-shore wind farms out; we are putting wave and tidal machines out. Perhaps I direct the question to Bob. Do you think we know enough about even the Continental Shelf, never mind the deep sea beyond it, in order to have marine protected areas at the moment, or is this a fairly unknown research area?

Professor Watson: I think the question is: what are we protecting and why are we protecting it? There are many things you can protect. There is a complete dearth of marine protected areas anywhere in the world. If you compare the marine protected areas compared to terrestrial protected areas, there is a couple of percent across the world. I think one of the questions we have, and I have got the same question actually, a major question on terrestrial protected areas, first, do we know what we are protecting and why and do we know how to protect it? Let me say why I think it is a challenge, and I think it is a challenge both in the marine environment and the terrestrial environment. If we are correct about climate change, the climatic zones for a species in an

ecosystem could well shift 300 to 500 kms poleward, towards the North Pole in the northern hemisphere and the South Pole in the southern, and could move up an altitude in grading a mountain by 300 to 500 metres. In other words, if you have tried to protect a particular species where it may sit very happily today, it may no longer potentially even reside in the UK, or, if you are in Brazil, it may not even reside in the protected area you have got. So one of the challenges we face is not only to decide what do we want to protect and why but, if, indeed, we are seeing a major change in the environment, and climate change is the classical one that I would put, we have got to think what the implications of climatic change are, to think through the whole concept of protected areas, and so there is a real challenge whether it is in the terrestrial biosphere or in the aquatic biosphere.

Q56 Ian Stewart: Some of the climate change things are going to happen, so why do we try to protect the north Norfolk coast? Why do we protect the Broads, Bob? Why not just flood them? Nature Heritage has said that, has it not?

Professor Watson: I think the question we have to decide is what we want to protect and why, and, clearly, for those living in the Norfolk Broads and in Norfolk, they would want to protect it. I think the question is, and it is a classical question, what parts of the coast do you protect, what parts do you let retreat, and then you have to look at it from an economic, social, environmental perspective. There will be parts, I believe, of the north Norfolk coast that you actually purposefully will protect and parts that you may actually allow to retreat because it is actually the most cost-effective and socially defensible.

Q57 Ian Stewart: So you would protect the Labour seats, I hope, and allow the Liberal Democrats to sink!

Professor Watson: I would hate to make a political statement.

Q58 Chairman: There were a number of rotten boroughs which are in the sea and perhaps others will follow them!

Hilary Benn: Can I just add to the question. When we launched the Marine Bill I went out, for the first time in my life, to see an off-shore wind farm off Whitstable, and one of the things that is immediately obvious when you go and have a look is that the putting in of the piles would have disrupted things down below, but once you have got one of those things there you are not going to go and fish there. One very interesting question for me also as a lay person is: what is the long-term impact of that and do you find that things recover quicker than people thought and do you find that species of fish will actually tend to congregate there because, by definition, people cannot come and fish? The interrelationship between the human activity and biodiversity is something that we need better to understand, because one thing I think we do learn from nature is that in the right circumstances it is pretty vigorous and pretty good at redeeming itself

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and recovering sometimes in ways that would astonish us. The other thing is that in the publication—I see that Bob has got it here—as someone who was new to this when we produced this very nice brochure publicising the work we are doing on the Marine Bill, some of the photographs there, if you showed them to people and said, “Where in the world do you think these pictures were taken?”—this goes back to your question about public awareness and understanding—people would have said, “That is the Bahamas. That is the Great Barrier Reef”, when actually they are taken in the seas around our coast. Understanding what is there and how marvellous and wonderful some of it is, it seems to me, the reason why there is so much support for the Marine Bill and why we are going to go on and get it on the statute book.

Q59 Chairman: Before the election in 2010! Can I finally turn to an issue which you have both raised on a number of occasions this afternoon, and that is this issue of monitoring and the importance of monitoring? In fact those of us that took part in this investigation I think were struck by just how crucially important maintaining long-term datasets is, maintaining our support for the ARGO floats programme and, more so, for deep-ocean piling, and so on, and I just wonder what additional money is in the CSR, to start with, to actually support marine science as a whole, but particularly the preservation of long-term datasets? Is there any additional money at all?

Professor Watson: As you know, we have kept the Defra budget constant from last year to this year for research at around £132 million per year and in the monitoring and surveillance issues we are trying to get a handle around it. NERC, of course, had just over a 5% increase in their research budget, but a significant amount of that got eaten up by overheads, et cetera. To be honest, I would imagine the total budget for the long-term monitoring is fairly flat, but this is why we need to look at the research strategy and monitoring strategy to ask are we putting enough emphasis on monitoring versus some other elements of research, how does the UK monitoring fit within the global perspective? You are absolutely right, long-term monitoring is absolutely critical—there is no question—for trying to understand things such as changes in the earth’s climate and changes in biodiversity. There are short-term fluctuations that can be seasonal, inter-annual, even decadal, so unless you look at the processes over a long period of time you cannot tell what is a natural fluctuation versus what is a long-term trend, which may be induced by human activity. Equally, if you then put a policy in place, say, to try and reverse damage, you also need the long term to see whether or not that policy is having the effect it is. I can only agree with you on long-term monitoring, but to me it is one of the biggest challenges we in the UK face.

Q60 Chairman: I am grateful for that because I think that confirms what the Committee concluded, but we made a proposition. We understood the difficulty, for instance, of the research councils

which say, “Look, our job is basic research. Monitoring is not basic research, even though we use the results of monitoring for our basic research”. The Departments say, “That is not our job. Our job is to make sure it is the here and now that we are looking after”. We made a proposal that, in fact, the agency or the new committee would have a budget which would control the issue of long-term monitoring, in other words to take it out of, if you like, that constant football match between departments and research councils. Why do you think that was rejected, Secretary of State or Professor Watson? It seemed a fairly sensible solution.

Hilary Benn: It remains a problem. The difficulty is finding a solution for it, given what you have just very clearly set out, as to what the different partners think their responsibility is, but I would be very happy to ask the MSCC because it is there to do a job of work to look at this. If you take examples like the ARGO Programme or Jason-2, it would be good to try and find a way of doing it. What I am reluctant to do is to sit before the Committee today and say, “I have got a pot of money that I could draw upon”, because I have not. One of the things I have had to do, as all Secretaries of State have to do, is to make sure the budget of Defra balances. We have got things we are investing more money in, going back to Dr Gibson’s question, flooding and coastal defence, a big increase over the next two years, I have got animal diseases to deal with and in the end we have to take some decisions. Bob and I have had a lively conversation about the research budget and what Bob describes is what we have ended up with in terms of the cash sum, but could I suggest that we ask the MSCC, as part of its work, to look at this.

Q61 Chairman: The UK Marine Monitoring and Assessment Strategy identified somewhere in the region of £20 to £25 million which was required to plug the gaps within our monitoring system and maintain existing monitoring systems and there is no way of filling that gap. What Professor Watson and yourself agree are crucial areas in terms of maintaining these long-term data sets will not happen, so what do we do about it?

Hilary Benn: I am being straight and saying I have no money that I bring to the Committee today to say, “I can tell you we are going to fill the gap”, but the issue that you identified does not go away for the reasons you set out very clearly in the report. I would suggest humbly that we ask the MSCC to apply its mind to this and to see if there is a way of providing some greater reassurance so there is not the kind of hand to mouth existence which there has been. I think that is all I can say in answer to the question.

Professor Watson: That would be my comment. I think we have again to go right back to what are our policy objectives, what are our research objectives, what are the needs in both the research side of the equation, what are the monitoring requirements and then I would also ask how do these prioritise relative to, say, the atmospheric monitoring or the land surface monitoring. Personally, I cannot take the marine, even though we are talking about marine

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science and monitoring here, completely out of the equation of the other elements of the earth's system because normally we are trying to answer some big earth system questions, of which marine is a part, but I think there are major issues with long-term monitoring. You are absolutely right, I have seen it in other countries as well, everybody points at each other and says, "You're in charge of monitoring", and it is one of the biggest dilemmas. I would argue, just like Hilary, that this co-ordinating committee should look at this as a very specific issue of how you prioritise limited resources.

Q62 Dr Gibson: Of the financial interactions in the consortium sense in other areas of endeavour, you would try to say, "Look, you have a responsibility for this, so have you; can we put something together". In the Norfolk coast you will have Bacton, for example, and the Home Office has got responsibilities there and so on. You do need some kind of creative activity between different organisations to meet the problems because we will all suffer.

Hilary Benn: Let us ask the MSCC to see if they can provide that creativity.

Q63 Chairman: Finally, could I ask you, Secretary of State, both of you have mentioned this issue of raising public awareness and certainly Dr Gibson mentioned it too. Is there a distinct strategy within the Department for you, as Secretary of State, to lead in terms of this raising of public awareness? Some of the issues that we raised within this particular report were very, very crucial to the marine science community but did not really ring many bells, for instance, in the broader media which did not pick it up as a major issue.

Hilary Benn: I could say equally that when the Marine Bill was published, I suppose because there is a large measure of support for it, it did not get as much coverage as it might have got if people were raging and screaming about it. It was a reflection of our broader society, which we will leave for another occasion. The Marine Bill, as well as the Committee's report and the strategy that is going to be drawn up are all opportunities which each of us has got to seize in the most effective way to make the point. The greatest advocates of all for marine science are the folk who are doing the scientific

research and providing opportunities for them to tell their stories about what they have done and what they have found; that is actually how you inform, inspire and encourage. It will also help to address one of the other issues that you put down in your report which is encouraging more people to come and do this, for young people to think, "Hey, that's what I want to do. I want to help discover what is down there so we can have good, decent marine conservation zones based on proper evidence". It then becomes a virtuous circle and there is a lot of fantastic stuff out there, which I am just beginning to learn about. Let us work together and find ways.

Q64 Dr Gibson: Have Nobel Prizes been won in this area yet, Robert, not that is the sole criterion, but it certainly helps?

Professor Watson: No. In fact, when you look at the Nobel Prizes they are very explicitly, as you know, for physics, chemistry, et cetera. There is one Nobel Prize for the three scientists who understood stratospheric ozone depletion, Roland, Crutzen and Molina, and there has been one Nobel Prize, of course, the Peace Prize for the Intergovernmental Panel on Climate Change. There are other major prizes. The Japan Prize has got two big prizes, the Japan Prize and the Blue Planet Prize and they are quite significant amounts of money, and then there is something called the Zayed Prize, of which the Millennium Eco-System Assessment was one of the winners. They do not get publicity in the newspapers, even the Nobel Prize is there for half a day in some newspapers and it is gone. The way to get to the public is, indeed, through documentaries and maybe we need to work far more with a guy called Robert Lamb, who is a superb person who worked for TV and is an adviser to the BBC, and David Suzuki in Canada. The marine environment, as Jacques Cousteau found out, is so photogenic, so you can bring in the issue of fisheries collapse and the magnificence of underwater, even if they are short documentaries, that is the way we need to get to the public basically the importance of these systems.

Hilary Benn: Fewer body makeover, home makeover programmes on the TV and one or two on marine science. Let us hope somebody is listening.

Chairman: I am sure they have got mindreaders listening. Could I thank you very much indeed, Secretary of State, Professor Watson, for a very, very useful afternoon's session.

Memorandum from the Department for Environment, Food and Rural Affairs

INVESTIGATING THE OCEANS: UPDATE ON PLANS FOR THE NEW MARINE SCIENCE COORDINATION COMMITTEE

BACKGROUND

1. The HoC S&T Committee Report "Investigating the Oceans" was published on 16 October 2007, and the Government response was submitted on 19 December 2007. Because of time constraints, the Response indicated that it had not been possible to reach detailed agreement on all aspects of the new committee, the Marine Science Coordination Committee (MSCC). This paper provides a summary of progress on the formation of the MSCC. It is based on the work of a small Working Group, which brings together the major practitioners of UK marine science management. The views of the Group are not "official" at this stage but the paper will help the MSCC to consider important issues relating to its:

- Scope and remit.
- Structure and membership.
- Reporting arrangements.
- Proposed implementation timetable.

PROCESS TO DATE

2. Representatives of the main Departmental funders of UK marine science met on 31 January to discuss issues relating to the creation of MSCC, its reporting lines, terms of reference and membership. (See Annex I for list of attendees. DIUS could not be represented directly at this meeting, but has contributed its views to Defra during the subsequent MSCC planning process).

3. To make progress it was agreed that a small planning group would be formed with representatives from Defra, FRS, NERC, CEFAS and Met Office (See Annex 2). This paper summarises the Group's considerations to date on the key aspects of MSCC's formation.

4. The Group is now in the final stages of refining a paper which will be discussed by Departmental representatives at a meeting/workshop on 15 May. Following this meeting Defra proposes calling a first meeting of the MSCC to discuss the Planning Group's recommendations for the new Committee. The issue of reporting lines to Ministers will be resolved by Ministerial correspondence.

What are the main points emerging from the Planning Group?

BROAD TERMS OF REFERENCE

5. The Planning Group proposes that the following encapsulates the broad scope and remit of the MSCC:

The MSCC will be charged with addressing four important issues:

- developing a UK strategic view for marine science and technology;
- improving the links between science and policy;
- improving marine science co-ordination, including identifying and addressing cross-cutting issues; and
- strengthening the UK's marine science capacity and capabilities;

6. The MSCC's role is not to dictate Departmental responsibilities for marine science. Rather its role is to act on the four issues set out above and in doing so help the UK face up to future marine policy and science challenges.

7. The MSCC will provide leadership in joining up marine science across departments. The MSCC will also address UK coordination with Europe and internationally.

8. The MSCC will develop and agree a plan of action covering the next four to five years. The implementation of this plan will be the subject of a review in year five, and progress and other aspects will be included in an annual report from the MSCC. In 2010 the role of MSCC will be reviewed in the light of the new Marine Management Organisation, MMO.

9. The MSCC will be responsible for commissioning the Marine Science Strategy. To help take this important action forward the Planning Group has set up a small task group to commence scoping out the UK marine science strategy and estimating likely costs. The strategy will be published by summer/autumn 2009.

MSCC STRUCTURE AND MEMBERSHIP

10. Figure 1 illustrates the proposed structure for the Committee. It is suggested that members of the MSCC will be at the director level, representing the following Departments/Agencies:

- Defra;
- BERR;
- MoD;
- DfT;
- DIUS;
- NERC;
- Devolved Administrations;
- Environment Agency; and
- DFID.

11. It is proposed that the chairmanship will rotate, possibly every 18 months, between the major funders of marine science—Defra, NERC (DIUS), and the Scottish Department. The “chair elect” will act as a vice chair before assuming the role of chair, to promote continuity.

12. The Committee will be supported by the MSCC Support Group, composed of Departmental/Agency officials who have direct science budget responsibilities. In addition to the Departments represented on MSCC, the Support Group will include representatives from:

- Met Office;
- CEFAS;
- UKHO;
- JNCC; and
- FRS.

13. The Support Group will report at least annually to the MSCC, summarising progress and highlighting any issues that need resolving.

The MSCC, and Support Group, will be supported by a Secretariat.

Relationship with other groups

14. The relationship between MSCC and the Marine Assessment Policy Committee (MAPC) has yet to be considered in detail. One option is for MAPC to be merged with MSCC, and the Marine Assessment and Reporting Group (MARG) to become a major MSCC Working Group. The Marine Monitoring Organisation (MMO) will have significant interests in marine science and may therefore become a member of the MSCC.

Working Groups

15. A number of working groups will be established to take forward specific pieces of work, commissioned by MSCC. There will, for example, be a strategy working group, and others covering work currently under IACMST, including an international group. Working Groups will provide an important focus for wider stakeholder engagement.

Wider involvement

16. A small number of Independents will join the MSCC. They will be chosen by open selection and will serve for a fixed three year term, with possible extension for one further term. They will have a non-executive role and provide a challenge function. The same independents may also be asked by the MSCC Support Group to participate in certain key tasks and attend SG meetings. The strategy will be developed through wide consultation with industry, learned societies and others.

Budget

17. The MSCC's business will need to be adequately funded. It is proposed that an MOU, or similar agreement, will be developed between the members of MSCC which will include a commitment to contribute to a central budget, possibly based on the relative sizes of marine science budgets. This will help cover on-going costs for running the Secretariat and developing the strategy which will be a major cost item.

REPORTING ARRANGEMENTS

These will be explained further by the SoS at the meeting.

18. It is envisaged by the Planning Group that the Marine Strategy, which will be a major deliverable of the MSCC in the short to medium-term, will be owned and signed off by all relevant Ministers.

19. The MSCC will in its normal course of business report annually to all Ministers.

20. Where there are issues relating to failures of coordination, or problems with the delivery of the Strategy, the MSCC will be responsible for resolving issues in the first instance. If this is not possible the MSCC will propose solutions or options which can be considered, at the ministerial level.

IMPLEMENTATION TIMETABLE

21. The Planning Group will meet with departmental representatives on 15 May and through a workshop consider remaining issues. Defra will invite MSCC members to a first meeting, probably in June or July, to examine the Planning Group paper in detail, confirm the MSCC structure etc., develop a forward plan of action, and consider the shape and content of the Strategy.

April 2008

Annex 1**DEPARTMENTAL REPRESENTATIVES THAT MET ON 31 JANUARY 2009**

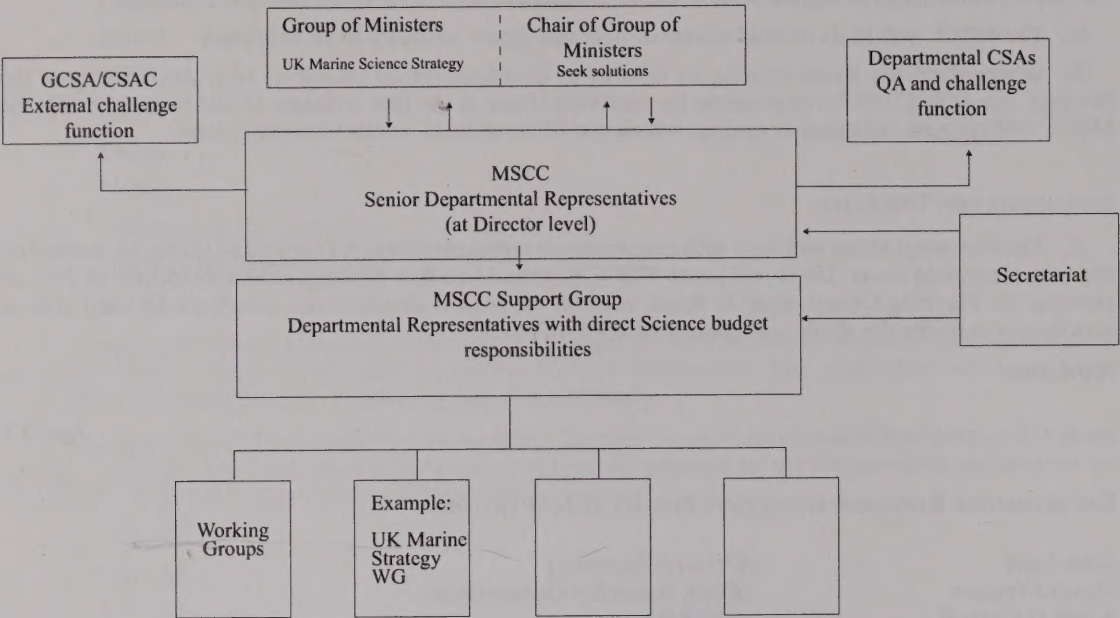
John Lock	(Defra) (Chairman)
Havard Prosser	(Welsh Assembly Government)
Kevin O'Carroll	(DBERR)
Martin Smith	(MOD)
Jon Turton	(Met Office)
David Millroy	(DfT)
Mike Webb	(NERC)
Bill Turrell	(Scottish Government)
Joe Horwood	(Cefas)
Ed Hill	(NOCS)
Paul Canham	(UKHO)
Matt Service	(AFBI)
Andrew Wither	(EA)
Trevor Guymer	(IACMST) (Secretary)

Annex 2**MEMBERS OF THE MSCC PLANNING GROUP**

John Lock	Defra (Chairman)
Ed Hill	NOCS
Mike Webb	NERC
Robin Cook	Scottish Government
Mike Waldock	Cefas
Joe Horwood	
Mike Bell	Met Office
Trevor Guymer	IACMST (Secretary)

Figure 1

MSCC SUGGESTED STRUCTURE



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ISBN 978-0-215-52049-4



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